



INDUSTRIAL COMMISSION OF NORTH DAKOTA

Doug Burgum
Governor

Drew H. Wrigley
Attorney General

Doug Goehring
Agriculture Commissioner

Tuesday, May 28th, 2024

Governor's Conference Room or Microsoft Teams – 1:00 pm

Meeting Coordinators:

Karen Tyler, Interim Executive Director

Reice Haase, Deputy Executive Director

Brenna Jessen, Recording Secretary

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I. Roll Call and Pledge of Allegiance

II. Office of the Industrial Commission – Karen Tyler, Reice Haase

- A. **Consideration of April 30, 2024 Meeting Minutes** (Attachment 1)
- B. **Consideration of updated professional services contract for Pipeline Authority** (Attachment 2)
- C. **Consideration of updated professional services contract for Transmission Authority** (Attachment 3)
- D. **Consideration of contract template for administrative management and technical support for Industrial Commission research and development programs** (Attachment 4)
- E. Other Office of Industrial Commission Business

(approximately 1:15 pm)

III. North Dakota Mill and Elevator – Vance Taylor, Cathy Dub, Karen Tyler

- A. Presentation of Fiscal Year 2024 3rd Quarter Results (Attachment 5)
- B. **Recommendation to contract for consulting services** - Cathy Dub, Karen Tyler
- C. Other Mill and Elevator Business

(approximately 1:30 pm)

IV. North Dakota Public Finance Authority – DeAnn Ament

A. Consideration of the following State Revolving Fund loan applications:

- i. **City of Minot – Drinking Water - \$3,704,000** (Attachment 6)
- B. Presentation of State Revolving Fund loans approved by the Public Finance Authority Advisory Board (Attachment 7):
 - i. Drake – Clean Water - \$149,000
 - ii. Medina – Drinking Water - \$1,250,000
 - iii. Northeast Regional Water District - Drinking Water - \$1,768,000
- C. Other Public Finance Authority Business

(approximately 1:45 pm)

V. North Dakota Housing Finance Agency, David Flohr, Brandon Dettlaff, Kayla Axtman

- A. **Consideration of changes to FirstHome Income Limits** – Brandon Dettlaff (Attachment 8)
- B. Report on 2024 Series AB Bond Issue – Kayla Axtman (Attachment 9)
- C. Other Housing Finance Agency Business

(approximately 2:00 pm)

VI. Renewable Energy Program – Reice Haase, Charlie Gorecki

A. Consideration of Grant Round 53 Recommended Award:

- i. R-053-B – Regional Electric Vehicle Infrastructure Resiliency (REVIR) Plan; Submitted by EERC; Total Project Costs: \$1,875,000; Award Amount: \$375,000 (Attachment 10)
- B. Other Renewable Energy Program Business

(approximately 2:15 pm)

VII. Lignite Research, Development and Marketing Program – Reice Haase, Mike Holmes, Claire Vigesaa

- A. Presentation of Lignite Research Program Project Management and Financial Report – Reice Haase (Attachment 11)
- B. Presentation of Lignite Research and Development Report – Mike Holmes (Attachment 12)
- C. **Consideration of Grant Round 104 Recommended Awards:**
 - i. LRC-104A: Continued Funding for Regional Lignite Public Affairs Program (Attachment 13)
 - ii. LRC-104B: Phase I Bridge Study for CCS at Coal Creek Station (Attachment 14)

- iii. LRC-104C: Lignite Conversion Reactor Optimization for Commercial Carbon Pitch Manufacturing (Attachment 15)
- D. **Consideration of Transmission Authority Request for \$582,795: IJJA Grid Resiliency FY 2024 Match** – Claire Vigesaa (Attachment 16)
- E. Other Lignite Research, Development and Marketing Program Business

(approximately 2:45 pm)

VIII. Bank of North Dakota – Todd Steinwand

- A. Presentation of North Dakota Guaranteed Student Loan Program Audit – Darrell Lingle, Eide Bailly (Attachment 17)
- B. Presentation of Independent Auditor’s Report and Financial Statement for Bank of North Dakota for year ending Dec 31, 2023 (FASB) – Darrell Lingle, Eide Bailly (Attachment 18)
- C. Presentation of 2023 BND Annual Report – Todd Steinwand (Attachment 19)
- D. Presentation of March 20, 2024, Nonconfidential Finance and Credit Committee Minutes (Attachment 20)
- E. Presentation of March 21, 2024, Nonconfidential Advisory Board Committee Minutes (Attachment 21)
- F. Other Bank of North Dakota Business

Meeting Closed to the Public for Executive Session Pursuant to NDCC 6-09-35, 44-04-18.4, 44-04-19.1 and 44-04-19.2

(approximately 3:00 pm)

IX. Bank of North Dakota Executive Session – Todd Steinwand, Kirby Evanger, Craig Hanson

- A. Presentation of Concentrations of Credit as of March 31, 2024 – Kirby Evanger (Confidential Attachment 22)
- B. Update on one loan – Craig Hanson
- C. Presentation on one loan – Todd Steinwand
- D. Presentation of March 20, 2024, Confidential Finance and Credit Committee Minutes (Confidential Attachment 23)
- E. Presentation of March 21, 2024, Confidential Advisory Board Minutes (Confidential Attachment 24)
- F. Other Bank of North Dakota Confidential Business

(approximately 3:30 pm)

X. Attorney Consultation

- A. Changes to the Renewable Energy Standard and the Newly Created Carbon Free Standard under Minn. Stat. § 216B.1691 (Confidential Attachment 24a)
- B. Litigation Strategy Discussion
 - i. Northwest Landowners v. NDIC
 - ii. BLM Resource Management Plan
 - iii. BLM Conservation and Landscape Rule
 - iv. BLM Mineral Leases and Leasing Process Rule

Meeting Returns to Public Session

(approximately 4:00 pm)

I. Formal Action taken in Public Session

(approximately 4:15 pm)

II. Legal Update – Phil Axt, Lynn Helms

- A. Litigation Update
 - i. NDIC v. DOI Quarterly Federal Lease Sales – Lynn Helms
 - ii. Northern Oil and Gas v. Continental Resources, NDIC et al – Lynn Helms
- B. Federal Regulatory Update – Lynn Helms
 - i. EPA Methane Waste Emission Charge
 - ii. BLM Venting and Flaring
 - iii. Dakota Prairie Grasslands Travel Management Plan
 - iv. DAPL Draft Environmental Impact Statement
 - v. Federal Executive Order 14008
- C. Other Industrial Commission Legal Updates

* Possible Executive Session under N.D.C.C. 44-04-19.1(9) & 44-04-19.2 for attorney consultation

(approximately 4:30 pm)

III. Department of Mineral Resources – Lynn Helms, Ed Murphy

- A. Geological Survey Quarterly Report (Attachment 25)
- B. **Consideration of the following cases:**
 - i. Order No. 33319 issued in Case No. 30669 regarding an application of Hess Bakken Investments II, LLC to establish a 1,280-acre spacing unit in McKenzie County, ND (Attachment 26)

- ii. Order No. 33464 issued in Case No. 30804 regarding an application of Hess Bakken Investments II, LLC to establish an overlapping 3,840-acre spacing unit in McKenzie County, ND (Attachment 27)
 - iii. Order No. 33469 issued in Case No. 30809 regarding the confiscation of equipment and salable oil at the Erickson 1-27H well in Divide County, ND (Attachment 28)
 - iv. Order No. 33470 issued in Case No. 30810 regarding the confiscation of equipment and salable oil at the Landstrom 1-33H well in Divide County, ND (Attachment 29)
 - v. Order No. 33471 issued in Case No. 30811 regarding the confiscation of equipment and salable oil at the Burner 1-34H well in Divide County, ND (Attachment 30)
 - vi. Order No. 33472 issued in Case No. 30812 regarding the confiscation of equipment and salable oil at the 29-144-102 Burlington Northern 1 well in Billings County, ND (Attachment 31)
- C. Report on Abandoned Well Plugging and Site Restoration Fund settled civil cases
 - D. Industrial Commission Resolution of Appreciation for Lynn Helms (Attachment 32)
 - E. Delegation Resolution for Geological Survey (Attachment 33)
 - F. Delegation Resolution for Oil and Gas Division (Attachment 34)
 - G. Other Department of Mineral Resources Business

IV. Adjournment – Transition into Pioneer Room for Lynn Helms retirement celebration

Next Meeting – June 27th, 2024, 1:00 pm
Governor's Conference Room, Bismarck, ND

Minutes of a Meeting of the Industrial Commission of North Dakota

Held on April 30, 2024 beginning at 12:30 p.m.

Governor's Conference Room – State Capitol

Present: Governor Doug Burgum, Chairman
Attorney General Drew H. Wrigley
Agriculture Commissioner Doug Goehring

Also Present: This meeting was open through Microsoft Teams so not all attendees are known.
Agency representatives joined various portions of the meeting.

Governor Burgum called the meeting of the Industrial Commission to order at approximately 12:35 p.m.

Ms. Karen Tyler took roll call. Governor Burgum, Attorney General Wrigley and Commissioner Goehring were present.

Governor Burgum invited the room to stand and join the Commission in reciting the Pledge of Allegiance.

OFFICE OF THE INDUSTRIAL COMMISSION

Ms. Karen Tyler presented for consideration of approval the March 26, 2024 Industrial Commission meeting minutes.

It was moved by Attorney General Wrigley and seconded by Commissioner Goehring that the Industrial Commission approve the March 26, 2024 Industrial Commission meeting minutes.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

Under other business, Ms. Tyler presented for consideration of approval a Request from the ND State Investment Board (SIB) to enter into an agreement with the State Historical Society of ND (SHSND) for investment management services for SHSND Endowment Funds.

Pursuant to NDCC 21-10-06, Industrial Commission approval is required to enter into such an agreement. Previously, in April of 2022, the Industrial Commission approved the agreement for the SIB to provide investment management services to the Historical Society for the Lewis & Clark Interpretive Center Endowment Fund. These additional Endowments would be a new and separate relationship, and as such require Commission approval.

The Historical Society Endowment Funds are for projects related to:

- Marquis de Mores Home in Medora
- Pembina State Museum
- Missouri-Yellowstone Confluence Interpretive Center
- Fort Buford State Historic Site
- Reference Services in the State Archives.

The funds are currently in the cash account of the State Treasurer and total assets of the endowments are between \$800,000-900,000.

The memo reads as follows:

“ The North Dakota Century Code states in 21-10-06:

... The state investment board may provide investment services to, and manage

the money of, any agency, institution, or political subdivision of the state, **subject to agreement with the industrial commission**. The scope of services to be provided by the state investment board to the agency, institution, or political subdivision must be specified in a written contract. The state investment board may charge a fee for providing investment services and any revenue collected must be deposited in the state retirement and investment fund.

Attached is a request from the Retirement and Investment Office's Chief Financial Officer for the State Investment Board to be permitted to enter into an agreement with the State Historical Society to provide investment management services for their Endowment Funds, which are described in the attached letter.

The Commission has previously approved the Investment Board providing this service for the State Historical Society's Lewis and Clark Interpretive Center Endowment Fund. It is my recommendation that this request be granted.”

It was moved by Commissioner Goehring and seconded by Attorney General Wrigley that the Industrial Commission grant the State Investment Board's request to enter into an agreement with the State Historical Society to provide investment management services for the State Historical Society's Endowment Funds.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

NORTH DAKOTA PUBLIC FINANCE AUTHORITY

Ms. Mindy Piatz of Brady Martz gave a presentation of the 2023 Audit. The audit covered the accompanying financial statements of the governmental activities, the business-type activities, and each major fund of the North Dakota Public Finance Authority, as of and for the years ended December 31, 2023 and 2022, and the related notes to the financial statements, which collectively comprise the North Dakota Public Finance Authority's basic financial statements. In the audit firm's opinion, the financial statements referred to above present fairly, in all material respects, for the years then ended in accordance with the accounting principles generally accepted in the United States of America.

Ms. DeAnn Ament gave a presentation of the Public Finance Authority 2023 Annual Report.

The North Dakota Public Finance Authority (PFA) was established for the purpose of making loans to political subdivisions of the State through the purchase of municipal securities which, in the opinion of the Attorney General of North Dakota, are properly eligible for purchase by the PFA. Subject to credit and program requirements, a loan can be made by the PFA to a political subdivision for any purpose for

which the political subdivision has the legal authority to borrow money through the issuance of municipal securities. Certain types of municipal securities issued under N.D.C.C. ch. 40-57 (MIDA bonds) may also be purchased by the PFA.

Capital Financing Program

Under its Capital Financing Program (CFP), the PFA makes loans for the purpose of financing projects or improvements for which political subdivisions are legally authorized to borrow money through the issuance of municipal securities. Subject to credit requirements and certain program requirements, financing is available in any dollar amount.

The interest rates payable by a political subdivision are market rates, which are set through a competitive bid process when the PFA issues and sells its bonds to fund a loan. The interest rates paid by the PFA on its bonds are the same rates a political subdivision will pay on its municipal securities sold to the PFA.

There were no CFP Bonds issued in 2023. The total outstanding amount of CFP Reserve Fund Letters of Credit on December 31, 2023 was \$27,079,973. The CFP Reserve Fund Letters of Credit are issued to meet the requirement of the CFP General Bond Resolution that the PFA maintain reserves for each series, equal to the largest aggregate amount of principal and interest due in any twenty-four-consecutive month period.

As of December 31, 2023, the total cumulative amount of bonds issued under the CFP General Bond Resolution was \$264,125,000 and the total outstanding amount of bonds under the CFP General Bond Resolution was \$113,755,000.

Capital Financing Disaster Loan Program

On June 16, 2011, the Industrial Commission authorized the PFA to utilize the Capital Financing Program to provide loans for political subdivisions impacted by weather related events. Under its Capital Financing Disaster Loan Program, the PFA makes loans for the purpose of providing disaster assistance to political subdivisions affected by weather related events until federal and state money is available and/or to assist in cash flowing local match requirements.

Any North Dakota political subdivision that is within a county that has received a Presidential Public Disaster Declaration, or a gubernatorial executive order or proclamation of a state disaster or emergency was eligible to apply. The political subdivision must show ability to repay the financing either from Federal or State government disaster payments or from tax receipts. The interest rate payable by a political subdivision is the 1-month Federal Home Loan Bank plus 2% adjusted monthly with a floor of 2%.

There were no Disaster Financing loans approved in 2023. Loans approved under this program total \$71,531,546 and none were outstanding as of December 31, 2023. Part E of Attachment 1 beginning on page 1-4 of this Report contains a complete list, as of December 31, 2023, of all loans made by the PFA under the Disaster Loan Program, including the name of each political subdivision, the original amount of each loan, and the outstanding principal of each loan.

The proceeds of the CFP Disaster Bonds have historically been used to make loans to political subdivisions approved for financing under the Disaster Loan Program. The PFA did not sell any CFP Disaster Bonds to Bank of North Dakota in 2023. As of December 31, 2023, the total cumulative amount of bonds issued under the Disaster Loan Program was \$14,405,612 and there are no bonds outstanding under the Disaster Loan Program.

State Revolving Fund Program

The State Revolving Fund Program (SRF Program) was established in 1990 to enable North Dakota to receive federal capitalization grants as authorized under the Clean Water Act. In 1998, the SRF Program was amended to enable the State to receive capitalization grants as authorized under the Safe Drinking Water Act. The SRF Program grants, received from the United States Environmental Protection Agency, are to be used to make below-market interest rate loans to political subdivisions for the purpose of financing authorized projects, to establish reserve funds, and for other purposes under the Clean Water Act and the Safe Drinking Water Act. Authorized projects under the Clean Water Act include wastewater treatment facilities and nonpoint source pollution control projects. Authorized projects under the Safe Drinking Water Act include public water systems. The SRF Program is administered jointly by the North Dakota Department of Environmental Quality (DEQ) and the PFA.

The interest rates on SRF Program loans are set by the DEQ in consultation with the PFA. The interest rates are fixed for the term of a loan. The interest rate for tax-exempt SRF Program loans is 2.0%. Loans made with American Recovery and Reinvestment Act (ARRA) funds are at 1.0% and/or have a loan forgiveness component. Loans for lead service line replacement funded from Bipartisan Infrastructure Law funding will have a 0.5% interest rate.

The PFA approved \$135,731,193 of Clean Water SRF Program loans to 12 political subdivisions in 2023. The PFA approved \$42,155,000 of Drinking Water SRF Program loans to 15 political subdivisions in 2023.

The total amount of SRF Program Bonds issued under the PFA's SRF Program Master Trust Indenture is \$768,695,000. This total includes \$203,865,000 of the 1990, 1993, 1995, 1996, 1998, 2000, 2001, 2003A, 2003B, 2004, 2005, 2008, and 2011 SRF Program Bonds which have been advance refunded and are no longer considered to be outstanding. As of December 31, 2023, the total amount of SRF Program Bonds outstanding was \$278,770,000, and the total outstanding amount of SRF Program loans was \$858,344,505.

Industrial Development Bond Program

The Public Finance Authority's Industrial Development Bond Program (IDBP) provides loans to North Dakota manufacturers that meet the IRS definition for small issue manufacturers. Bonds issued under this Program are moral obligation bonds of the State unless the borrower has the financial strength to request that the Public Finance Authority issue the bonds on a conduit basis. Public Finance Authority limits the program to \$2,000,000 per borrower and \$20,000,000 for the entire program. For conduit issuance when the state's moral obligation is not used as a credit enhancement there are no project or program limits.

The interest rates payable by a borrower are market rates, which are set through a competitive bid process when the PFA issues and sells its bonds to fund a loan. The interest rates paid by the PFA on its bonds are the same rates a borrower will pay on its bonds sold to the PFA.

The outstanding amount of Reserve Fund Letters of Credit on December 31, 2023 was \$198,050. The IDBP Reserve Fund Letters of Credit are issued to meet the requirement of the IDBP General Bond Resolution that the PFA maintain reserves for each series, equal to the largest aggregate amount of principal and interest due in any twenty-four consecutive month periods. The IDBP Reserve Fund Letters of Credit are issued by BND.

Legacy Fund Infrastructure Bond Program

The Public Finance Authority’s Legacy Fund Infrastructure Bond Program (Legacy Bonds) was established in 2021 to transfer funds to the Bank of North Dakota (BND) to allocate to legislature approved state infrastructure projects and programs. Upon request by BND, funds are transferred to BND for disbursement to funded programs. Bond payments will be funded by capitalized interest, earnings on unspent bond proceeds, and transfers from ND Legacy Fund earnings.

PFA issued Legacy Bonds to finance the following projects approved during the 2021 legislative session:

Fargo Diversion Project	\$ 435,500,000
Resources Trust Fund	\$ 74,500,000
Infrastructure Revolving Loan Fund	\$ 50,000,000
Highway Fund	\$ 70,000,000
NDSU Agriculture Products Development Facility	\$ 50,000,000

No Legacy Bonds were issued in 2023. Under the Legacy Fund Infrastructure Program \$710,115,000 of bonds have been issued. As of December 31, 2023, the total amount of Legacy Bonds outstanding was \$681,655,000.

The full report is available on the website.

Ms. Ament presented for consideration of approval the following State Revolving loan applications:

- i. **City of Ashley – Drinking Water - \$3,048,000.** The purpose of this project is to replace the City’s existing 65,000-gallon water tower with a new 250,000-gallon elevated storage tank as well as demolish the City’s water treatment plant and 300,000-gallon underground storage reservoir. The requested term is 30 years, and the City will issue improvement bonds payable with special assessments. The average annual payment will be \$30,203.

It was moved by Commissioner Goehring and seconded by Attorney General Wrigley that the Industrial Commission approve the recommended \$3,048,000 Drinking Water State Revolving Fund Program loan to the City of Ashley.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

- ii. **Cass Rural Water Users District – Drinking Water - \$2,604,000.** The purpose of this project includes approximately 9.5 miles of new watermain, which will significantly enhance the capacity to convey more water from Reservoir B to Reservoir D and improve system pressures throughout Reservoir D service area. The requested term is 20 years, and the District will issue revenue bonds payable with water user fees.

It was moved by Commissioner Goehring and seconded by Attorney General Wrigley that the Industrial Commission approve the recommended \$2,604,000 Drinking Water State Revolving Fund Program loan to the Cass Rural Water Users District.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

- iii. City of Underwood – Drinking Water - \$3,500,000. The purpose of this project is to replace the water tower to alleviate water pressure issues and replace high service pumps to meet current standards. The requested term is 30 years, and the City will issue revenue bonds payable with water user fees. The average annual payment will be \$40,416.

It was moved by Commissioner Goehring and seconded by Attorney General Wrigley that the Industrial Commission approve the recommended \$3,500,000 Drinking Water State Revolving Fund Program loan to the City of Underwood.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

Ms. Ament presented the State Revolving Fund loans approved by the Public Finance Authority Advisory Committee.

- i. City of Grand Forks – Drinking Water - \$1,050,000. The purpose of this project is to begin the process of replacing some of the 700 known lead service lines. The requested term is 30 years, and the City will issue revenue bonds payable with water user fees.
- ii. City of Medina – Drinking Water - \$920,000. The purpose of this project is to complete phase 2 of the replacement of water main all services including two railroad crossings where new pipe is bored under the right-of-way. The requested term is 30 years and the City will issue improvement bonds payable with special assessments.

Under other business, Ms. Ament requested the Commission members sign a letter showing their support of the Council of Infrastructure Financing Authorities' effort to encourage funding of the CWSRF and DWSRF at congressionally authorized levels of \$3.25 billion each for the federal fiscal year 2025. Ms. Tyler circulated the letter for signatures.

STATE ENERGY RESEARCH FUND

Mr. Reice Haase presented for consideration of approval funding under contract SERC 2019-01 Task 2 – Provide Prompt Expertise for North Dakota: North Dakota Grid Resiliency Plan, \$87,000.

The memo reads as follows:

“During the 2023-2025 biennium, \$750,000 is available for the Commission to contract for on-demand studies under Contract SERC 2019-01 Task 2 – Provide Prompt Expertise for North Dakota. To date, \$135,000 has been contracted under Task 2, leaving \$615,000 for the remainder of the biennium. The EERC is requesting the Commission to authorize an additional **\$87,000** for work required to update the North Dakota Grid Resiliency Plan. The period of performance is estimated to be 8 months.

In 2023, the EERC prepared the first North Dakota Grid Resiliency Plan for the North Dakota Transmission Authority (NDTA). The resiliency plan evaluates the risks and threats that various hazards

pose to the North Dakota electric grid and addresses gaps in improving grid resiliency. It also focuses on a resilience assessment framework that evaluates the current resilience strategies and provides recommendations for improving grid resiliency in the context of emerging catastrophic threats to the regional grid.

The NDTA recently requested that the EERC update the resiliency plan through the State Energy Research Center similar the original plan's development. To accomplish the update, the EERC will review the current plan for accuracy and update all sections that are outdated or inaccurate. The proposed effort will also involve hiring the previous subcontractor to utilize their utility industry expertise. In addition, some content from the resiliency plan's 2024 update will be included in the North Dakota State Energy Security Plan.

Therefore, I recommend that the Commission authorizes \$87,000 from Contract SERC 2019-01 Task 2 – Provide Prompt Expertise for North Dakota for the purpose of completing an update to the North Dakota Grid Resiliency Plan.”

It was moved by Commissioner Goehring and seconded by Attorney General Wrigley that the Industrial Commission authorize \$87,000 from Contract SERC 2019-01 Task 2 – Provide Prompt Expertise for North Dakota for the purpose of updating the North Dakota Grid Resiliency Plan.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

RENEWABLE ENERGY PROGRAM

Mr. Haase gave a presentation of the Renewable Energy Program Project Management and Financial Report. This fund currently has \$8,895,902 committed and \$2,783,705 available for commitment. The funding for this program is \$3 million from oil production taxes. There have been 71 cumulative projects with 17 projects being active. This program has a cumulative value of \$24 million being granted and \$161.7 million in project value to the State of North Dakota.

Mr. Haase presented for consideration of approval the Grant Round 53 Recommended Award:

- i. **R-053-B – Regional Electric Vehicle Infrastructure Resiliency (REVIR) Plan, Submitted by EERC; Total Project Costs: \$1,875,000; Award Amount: \$375,000.** The primary objective of this project is to 1) provide technical assistance in developing the REVIR plan by facilitating coordination between interstate, intrastate, and community-level working groups and stakeholders to plan for, respond to, and recover from anticipated and unanticipated disruptions to charging infrastructure availability and services; 2) identifying and addressing regional EV charging risks and providing mitigation strategies for ensuring maximum regionwide EV infrastructure reliability, resilience, and security; and 3) providing guidance to communities and stakeholders in preparing for and adapting to technological and socioeconomic developments in transportation electrification and implementing resilience solutions.

There was discussion around what the other States are doing with regards to this project (specifically Minnesota), and what aspects of resiliency are being explored. This award was tabled until next month's meeting, so no motion was made to approve or deny the project.

Mr. Haase presented for consideration of approval a project decommitment:

- i. R-050-064 – Novel Process for Biocoal Production with CO₂ Mineralization; Submitted by Envergen, LLC in October 2022; Award Amount to be Decommitted: \$174,830. The proposal was originally submitted with cost-share being provided by a USDA project, but due to unforeseen circumstances, the period of performance of the cost-share project did not match and they do not have the cost-share at this time.

It was moved by Commissioner Goehring and seconded by Attorney General Wrigley that the Industrial Commission accept the recommendation of the Renewable Energy Council and decommit the following Renewable Energy Program project:

R-050-064 – Novel Process for Biocoal Production with CO₂ Mineralization; Submitted by Envergen, LLC in October 2022; Award Amount to be Decommitted: \$174,830

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

DEPARTMENT OF MINERAL RESOURCES

Dr. Lynn Helms presented for consideration of approval the following cases:

- i. Order No. 33067 issued in Case No. 30454 related to the confiscation of equipment and salable oil at the Brian and Linda Adams R-1 well.
- ii. Order No. 33068 issued in Case No. 30455 related to the confiscation of equipment and salable oil at the Adams 2 well.
- iii. Order No. 33069 issued in Case No. 30456 related to the confiscation of equipment and salable oil at the Adams 3 well.
- iv. Order No. 33070 issued in Case No. 30457 related to the confiscation of equipment and salable oil at the Adams 4 well.
- v. Order No. 33071 issued in Case No. 30458 related to the confiscation of equipment and salable oil at the Brian and Linda Adams SWD 1 well.
- vi. Order No. 33072 issued in Case No. 30459 related to the confiscation of equipment and salable oil at the Davis Perron 33-31 well.

It was moved by Commissioner Goehring and seconded by Attorney General Wrigley that the Industrial Commission approves Orders 33067, 33068, 33069, 33070, 33071, and 33072 issued in Cases 30454, 30455, 30456, 30457, 30458, and 30459 respectively, authorizing the confiscation of equipment, bonds, and salable oil as well as the Brian and Linda Adams R-1, Adams 2, Adams 3, Adams 4, Brian and Linda Adams SWD 1, and Davis Perron 33-31 wells operated by Double AA Oil, L.L.C., or any working interest owners, pursuant to NDCC 38-08-04 and 38-08-04.9.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

- vii. Order No. 33155 issued in Case No. 30542 related to an application of Phoenix Operating LLC for a 1,920-acre spacing unit in Williams and Divide Counties, ND.
- viii. Order No. 33315 issued in Case No. 30665 related to spacing units in the Burg, Big Stone, and Skabo Bakken Pools in Williams and Divide Counties, ND.

It was moved by Commissioner Goehring and seconded by Attorney General Wrigley that the Industrial Commission approves Order 33155 and 33315 issued in Cases 30542 and 30665 respectively, denying an application of Phoenix Operating LLC to establish a 1,920 acre spacing unit described as Sections 2 and 11, T 159N, R 98W and Section 35, T160N, R 98W and approving the respacing of T 159N, R 98-100W and T 160N, R 98-100W to provide orderly development with 1,920 and 1,280 acre spacing units.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

- ix. Order No. 33314 issued in Case No. 30664 related to the unitized management and operation of the South Westhope-Charles Unit in Bottineau County, ND

It was moved by Commissioner Goehring and seconded by Attorney General Wrigley that the Industrial Commission approves Order 33314 issued in Case 30664 approving a petition of Resonance Exploration (North Dakota) LLC for an order providing for the unitized management, operation, and further development of the proposed South Westhope-Charles (Huber) Unit Area, consisting of lands within the South Westhope Field in Bottineau County, North Dakota; for approval of the unit agreement and unit operating agreement constituting the plan of unitization for the proposed South Westhope-Charles (Huber) Unit Area; for approval of the plan of operation; vacating the applicable spacing orders; and for such further and additional relief.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

- x. Order No. 33313 issued in Case No. 30663 related to an application of Resonance Exploration (North Dakota) LLC determining that the plan of unitization for the south Westhope-Charles Unit Area in Bottineau County, ND has been signed, ratified or approved by owners of interest.

It was moved by Commissioner Goehring and seconded by Attorney General Wrigley that the Industrial Commission approves Order 33313 issued in Case 30663 authorizing the Director of the Department of Mineral Resources to determine that the plan of unitization for the South Westhope-Charles (Huber) Unit Area, Bottineau County, ND, has been signed, ratified or approved by owners of interest owning that percentage of the working interest and royalty interest within said unit as is required by applicable statutes and rules of the Commission.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

- xi. Order No. 33256 issued in Case No. 30607 related to an application of Petro-Hunt L.L.C. to establish an overlapping 3,840-acre spacing unit in Mountrail County, ND.

It was moved by Commissioner Goehring and seconded by Attorney General Wrigley that the Industrial Commission approves Order 33256 issued in Case 30607 approving an application of Petro-Hunt, L.L.C. for an order amending the applicable orders for the Tioga, East Tioga and/or White Earth-Bakken Pools to establish an overlapping 3840-acre spacing unit described as Sections 20, 21, 28, 29, 32 and 33, T.158N., R.94W., Mountrail County, ND, and authorize one horizontal well to be drilled on such unit, or granting such other relief as may be appropriate.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

- xii. Order No. 33382 issued in Case No. 30723 related to the termination of the Eland East-Lodgepole Unit in Stark County, ND.

It was moved by Commissioner Goehring and seconded by Attorney General Wrigley that the Industrial Commission approves Order 33382 issued in Case 30723 approving a motion of the Commission to consider the termination, or any other appropriate action, of the Eland East-Lodgepole Unit, Stark County, ND, operated by Wesco Operating, Inc.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

- xiii. Order No. 33343 issued in Case No. 30693 related to an application of XTO Energy Inc. for a pilot enhanced oil recovery operation in Dunn County, ND.

It was moved by Commissioner Goehring and seconded by Attorney General Wrigley that the Industrial Commission approves Order 33343 issued in Case 30693 approving an application of XTO Energy Inc. for an order granting temporary authority to use the Nygaard Federal 13X-5A well (File No. 21702), Nygaard Federal 13X-5BXC well (File No. 32917), Nygaard Federal 13X-5B well (File No. 32919), located in a spacing unit comprised of Sections 8 and 17, T.148N., R.96W., and the Nygaard Federal 13X-5AXD well (File No. 32921), located in a spacing unit comprised of Sections 7, 8, 17 and 18, T.148N., R.96W., Dunn County, ND, as injection wells for a pilot enhanced oil recovery operation in the Lost Bridge-Bakken Pool, and such further and additional relief.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

LEGAL UPDATE

Litigation Update:

- i. Northwest Landowners v. NDIC – Our motion for summary judgement was filed on April 12th. The other motions for summary judgement are due May 13th.
- ii. EPA Mercury and Air Toxics Standards (MATS) – Just received the re-publication from the EPA on the 25th along with 3 other rules. We are currently reviewing the differences from the previously proposed rule.
- iii. EPA Coal Combustion Residuals (CCR) Rule – pre-published last week, working on litigation strategy and looking at the differences between prior rules.
- iv. EPA Greenhouse Gas Rule – pre-published last week, working on litigation strategy and reviewing the differences between prior rules.

- v. NDIC v. DOI Quarterly Federal Lease Sales – Status conference on May 29th. Filed a request with Judge Trainer on April 12th for BLM to produce 5 documents and 3 witnesses.
- vi. North Oil and Gas v. Continental Resources, NDIC et al – the case settled and has been dismissed. \$300,000 to go back into the Abandoned Well and Site Reclamation Fund.

Federal Regulatory Update:

- i. BLM Resource Management Plan – Waiting on publication
- ii. BLM Conservation and Landscape Rule – Finalized and published a preliminary version. Plan to start implementing it on May 18th. Currently looking for other state partners.
- iii. BLM Mineral Leases and Leasing Process Rule – Pre-publication was April 12th. Waiting on final publication. ND is in a unique split of state, and already has the ongoing case in Judge Trainer’s court. Wyoming is indicating they will be joining us.
- iv. EPA Methane Waste Emission Charge – Comments were filed March 26th.
- v. BLM Venting and Flaring – Final on April 5th. We filed our complaint on April 24th. We are being joined by Montana, Wyoming and Utah with our complaint.
- vi. Dakota Prairie Grasslands Travel Management Plan – moving along slowly. Targeting July 2025 for finalizing.
- vii. DAPL Draft Environmental Impact Statement – expecting to hear on this in 4th quarter.
- viii. Federal Executive Order 14008

NORTH DAKOTA HOUSING FINANCE AGENCY

Mr. Dave Flohr presented for consideration of approval the 2025 Low Income Housing Tax Credit Qualified Allocation Plan.

The memo related to the LIHTC Plan reads as follows:

“The NDHFA Advisory Board recommends the **Industrial Commission approve the 2025 Low Income Housing Tax Credit Qualified Allocation Plan (attached)**.

Section 42 of the Internal Revenue Code requires that the Agency allocate Low Income Housing Tax Credits in accordance with a Qualified Allocation Plan (QAP).

The initial draft 2025 QAP was published on February 14, 2024 for a 15-day public comment period that ended at 5 pm on March 1, 2024. A public hearing was held on March 5, 2024. Interested parties had the option to attend either in person at NDHFA Executive Board Room or via Microsoft Teams. Below is a summary of the substantive changes to the draft plan and the comments received. A copy of the final red-line draft is provided. Following Industrial Commission approval, the final QAP will be published to the Agency website.

The application round will open on September 1, 2024, and close on the last business day in September.

Section II. Project Rating (Scoring Criteria)

1. Universal Design (page 12)

The universal design scoring category incentivizes applicants to add certain accessibility features to the multi- family development. Significant changes were proposed to the universal design standards to reflect more objective and measurable design features, including incorporating design features that are

required to be project wide and others that are required in a percentage of the units. The total points available under the category was increased from 12 to 15. A separate universal design policy was created and will be used by all multifamily funding programs that have points for universal design. A copy of the policy is attached to the plan. The universal design policy underwent a separate public consultation process that included participation from the Centers for Independent Living, Money Follows the Person, Health and Human Services Aging Services Division, affordable housing development and architect partners.

2. Housing for Older Persons (page 13)

This section was updated to follow the Fair Housing Act's exemption of housing for older persons which allows for senior housing to be defined as:

- a. Provided under any state or federal program the Secretary of HUD has determined is specifically designed and operated to assist elderly persons; or
- b. 100% occupied by persons 62 years of age or older; or
- c. Houses at least one person 55+ in at least 80% of the occupied units and adheres to a policy that demonstrates an intent to house a person 55+.

Previously the scoring criteria referenced only exemption c. The proposed change expands the allowance to reflect all senior housing options that are available under the fair housing exemption, which was the initial intent of the criteria.

1. Preserve Existing Affordability (page 14)

The scoring criteria was redesigned to reflect different definitions of preserving affordability including

- a. Asset Preservation – preserving the physical asset. 10 pts.
- b. LIHTC Preservation- preserving an existing LIHTC project. 5 pts.
- c. Subsidy Preservation- preserving the housing subsidy. 10 pts.
- d. Subsidy Preservation Between Interested Parties- preserving existing subsidy, but the party that is receiving the subsidy is also the party that initially controls the subsidy. 5 pts.

NDHFA uses this scoring criteria to prioritize preserving existing affordable projects, providing assistance to housing authorities to reposition public housing inventory, and to ensure that we can maintain the current affordable housing portfolio. The new descriptions of preservation allow higher need preservation projects to rise to the top of the scoring criteria, while still providing some priority points to projects that are at less risk of immediate loss.

Comments were received requesting the agency to specifically name eligible programs such as HUD repositioning. The agency determined that attempting to identify all potential preservation projects may inadvertently qualify or disqualify projects that may or may not meet the intention of the scoring criteria.

Other Comment Received:

New Development/Preservation Parity (page 15)

Written comments were received requesting NDHFA to consider projects that preserve existing affordability to qualify under the preservation parity. This set aside parity is simply to ensure that annually at least one project that adds additional units and one project that rehabilitates/preserves existing units are selected for funding.

The category was updated to better describe the preservation to mean renovation or replacement of existing units.”

The full report of the LIHTC Plan can be found on the website.

It was moved by Commissioner Goehring and seconded by Attorney General Wrigley that the Industrial Commission approve the Housing Finance Agency’s 2025 Low Income Housing Tax Credit Qualified Allocation Plan.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

Mr. Flohr presented for consideration of approval the 2024 Housing Incentive Fund Allocation Plan.

The memo related to the HIF Plan reads as follows:

“The NDHFA Advisory Board recommends the Industrial Commission **approve the 2024 Housing Incentive Fund Allocation Plan as presented:**

Annually the agency is responsible for developing a Housing Incentive Fund Allocation Plan (the Plan). The plan identifies the process for which eligible applicants must apply for HIF funding including the scoring criteria that will be used to rank, score, and select successful applications for multifamily projects. The 2024 Plan made available public comment February 14-March 1, 2024. A public hearing was held on March 5th, 2024, at NDHFA’s office and via Microsoft Teams.

During the 68th Legislative Assembly, HIF was appropriated \$13.75 million and had two significant changes to century code, NDCC 54.17.40.

1. Addition of eligible activity 3.b. New Construction, Rehabilitation, preservation, or acquisition of a single-family housing project in a developing community or community land trust project.
2. Removal of the 10 percent set aside requirement for homelessness activities.

The agency set aside \$12 million for multifamily housing projects and \$1,750,000 for single family housing projects. A program update for the Single-family program will be provided in a separate report.

Attached is a copy of the draft 2024 HIF allocation plan with a summary of the substantial changes proposed and public comments received.

1. General Provisions (page 4)

Added Single-Family Project as an eligible use. Identified that a separate program addendum will be established for the activity.

2. Maximum Award (page 5)

- a. Added language to allow the maximum award for a Developing Rural Community (pop. 5,000 or below) to qualify for up HIF up to 50 percent of the total development costs, not to exceed \$3,000,000.

This proposed change was a solution identified by the Rural Housing Task Force. A copy of the task force's white paper is attached.

- b. Increase maximum allowable HIF for a 9% tax credit awards to \$400,000, \$800,000 developing community, and \$1,500,000 for developing rural community.

Discussion

Written comments were received requesting the agency consider increasing the amount available to a 9% LIHTC award from \$300,000 to \$1 million. After consideration of the amount of HIF and other gap funding sources available, the proposed change is to increase to \$400,000, \$800,000, and \$1,600,000 respectively.

3. Recognizable Costs (page 5)

Increase the maximum total development costs per unit from \$200,000 to \$300,000 per unit.

Discussion

Written comments were received to consider increasing the maximum total development costs per unit. The cost per unit was last updated in 2021.

4. Application Processing Fee (page 6-7)

Added a \$250 application processing fee for subsequent NDHFA-funded program applications.

Discussion

The proposal is to charge a nominal fee for each application that staff must review. The fee is to discourage frivolous multiple sources applications.

Scoring Changes Criteria Changes

1. Universal Design (page 12)

The universal design scoring category incentivizes applicants to add certain accessibility features to the multi-family development. Significant changes were proposed to the universal design standards to reflect more objective and measurable design features, including incorporating design features that are required to be project wide and others that are required in a percentage of the units. The total points available under the category was increased from 15 to 20. A separate universal design policy was created and will be used by all multifamily funding programs that have points for universal design. A copy of the policy is attached to the plan. The universal design policy underwent a separate public consultation process that included participation from the Centers for Independent Living, Money Follows the Person, Health and Human Services Aging Services Division, affordable housing development and architect partners.”

The full report of the Housing Incentive Fund Plan can be found on the website.

It was moved by Commissioner Goehring and seconded by Attorney General Wrigley that the Industrial Commission approve the Housing Finance Agency's 2024 Housing Incentive Fund Allocation Plan.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

Mr. Flohr gave a presentation of the 2024 HOME Program and 2024 Housing Trust Fund Allocation Plan.

2024 HOME Program

The state administers its program through Subrecipients, non-profit and for-profits, and CHDOs.

The HOME Program focuses on 3 major housing needs:

- i. Single-family Homeowner Rehabilitation
- ii. Rental Production and Rehabilitation
- iii. Homebuyer Down Payment Assistance

The full report of the HOME Program can be found on the website.

2024 Housing Trust Fund Allocation Plan

ND is expected to receive the small-state allocation from the National Housing Trust Fund. HUD authorizes NDHFA to expend from the HTF up to a maximum of 10 percent of the state allocation for reasonable costs to administer the HTF program. The maximum amount of administrative costs NDHFA may expend from the HTF will be evaluated a to reasonableness each year during allocation plan development.

Eligible recipients include:

- i. Units of local, state, and tribal government
- ii. Local and tribal housing authorities
- iii. Community action agencies
- iv. Reginal planning councils
- v. Non-profit organizations
- vi. For-profit developers

****Individuals are not eligible to receive direct assistance from the HTF.**

The full report of the Housing Trust Fund Allocation Plan can be found on the website.

Mr. Flohr gave a presentation of the 2024 Emergency Solutions Grant and 2024 ND Homeless Grant Allocation Plans.

The agency serves as the administrator for the Federal Emergency Solutions Grant (ESG) and the state appropriated ND Homeless Grant (NDHG). Similar to multifamily programs, the funds are allocated to recipients through the allocation plan which details the eligible activities and the selection criteria for

each program. The emergency solutions grant allocation plan is then incorporated into the HUD Annual Action plan for submission to HUD for approval.

Emergency Solutions Grant

Emergency Solutions Grants will be utilized to provide services to individuals experiencing homelessness and those at risk of becoming homeless in the following eligible activities.

- Street Outreach;
- Emergency Shelter;
- Homelessness Prevention;
- Rapid Re-housing Assistance; and
- Homeless Management Information System- HUD required homeless data repository.

Funding Level and Match

For FY 2024, an approximate amount of \$486,494 in federal funds will be made available. ESG requires 100 percent match on all but \$100,000 of the federal allocation or \$386,494. NDHFA proposed to use NDHG funding to provide 100 percent of the match requirement rather than relying on the non-profit recipients to provide and track match. This change eliminates administrative tracking.

ND Homeless Grant

Funding Level

For FY 2024, an amount of \$1,250,000 in state funding is available. NDHFA will use a portion of the funds available to provide 100 percent of the ESG match liability. This total is approximately \$386,494 subject to the final FY2024 ESG allocation from HUD. Match is calculated based on the total ESG allocation minus \$100,000. Additionally, a total of \$43,200 HIF Homeless funds will be allocated under the NDHG application round.

Applications will be reviewed and scored based on the selection criteria outlined in the Selection Criteria. The minimum award will be \$50,000, a maximum award level has not been established.

The full report of the Emergency Solutions Grant and the ND Homeless Grant Plan can be found on the website.

Under other business, Mr. Dave Flohr presented an update on a grant award from the Federal Home Loan Bank. BND and NDHFA, together, applied for a Member Impact Fund grant from the Federal Home Loan Bank. They were awarded \$5.125 million out of \$11 million that the state of ND got all together. BND's contribution was \$1.281 million, and the Federal Home Loan Bank matched that 3:1 and put in \$3.844 million. A good portion of these funds will go towards single-family rehabilitation and the rehab accessibility program.

BANK OF NORTH DAKOTA

Mr. Todd Steinwand presented the First Quarter 2024 Performance Highlights.

The first quarter 2024 ended with assets of \$10.5 billion driven by continued growth in the loan portfolio. The loan portfolio ended the quarter at \$5.8 billion. The timing in the funding of the State Institution loan programs as well as BND's Match program did not meet budget expectations in the Commercial Loan category. This was partially offset by the increased volumes in Commercial participation and Flex Pace programs. Activity in the Farm and Ranch program led to the Ag Portfolio having strong results. Residential loan runoff continues to slow due to the rise in interest rates, and the student loan portfolio continues to focus on state-sponsored DEAL loans. For the quarter ended March, the Bank has transferred \$5 million to buydown programs and \$700,000 to other state programs. During 2023, the Bank transferred \$140 million to the General Fund, \$30.5 million to buydown programs, \$52 million to the Infrastructure Revolving Loan Fund, and \$5.7 million to other state programs.

Net income for the first quarter 2024 was \$48.5 million. Interest Income exceeded budget by \$1.2 million, primarily due to higher rates on securities as well as rates and volumes in the commercial participation program offset by lower than budgeted balances at the Federal Reserve. A combination of higher average deposit balances, interest rates, and larger Federal funds purchased contributed to the higher interest expense. Non-interest Expense was \$1.3 million under budget. This consists of several operating components largely due to timing of incurrences, specifically with IT projects, loan servicing expenses, legal, and others service-related expenses.

Mr. Steinwand presented the Commission members with the following Non-confidential BND Advisory Board meeting minutes for their review:

- i. February 21, 2024 Nonconfidential Finance and Credit Committee Minutes
- ii. February 22, 2024 Nonconfidential Leadership Development and Compensation Committee Minutes
- iii. February 22, 2024 Nonconfidential Advisory Board Minutes

It was moved by Attorney General Wrigley and seconded by Commissioner Goehring that under the authority of North Dakota Century Code Sections 6-09-35, 44-04-18.4, 44-04-19.1, 44-04-19.2, the Industrial Commission enter into executive session for the purposes Bank of North Dakota confidential business.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

The Commission is meeting in executive session regarding Bank of North Dakota confidential business pursuant to N.D.C.C. 6-09-35 to consider those items listed on the agenda under Bank of North Dakota confidential business. Only Commission members, their staff, Commission staff, and BND staff will participate in that executive session.

Any formal action taken by the Commission will occur after it reconvenes in open session.

Governor Burgum reminded the Commission members and those present in the executive session that the discussions must be limited to the announced purposes which is anticipated to last approximately 30 minutes.

The executive session began at approximately 4:10 p.m.

The Meeting Closed to the Public for Executive Session Pursuant to NDCC 6-09-35, 44-04-18.4, 44-04-19.1, 44-04-19.2.

BANK OF NORTH DAKOTA EXECUTIVE SESSION

Industrial Commission Members Present

Governor Doug Burgum
Attorney General Drew H. Wrigley
Agriculture Commissioner Doug Goehring

BND Members Present

Todd Steinwand, BND
Kirby Evanger, BND
Craig Hanson, BND
Kelvin Hullet, BND
Rob Pfennig, BND
Kaylen Hausauer, BND

Others in attendance

John Reiten	Governor's Office
Ryan Norrell	Governor's Office
Zach Greenberg	Governor's Office
Dutch Bialke	Ag Department
Karen Tyler	Industrial Commission Office
Reice Haase	Industrial Commission Office
Erin Stieg	Industrial Commission Office

The executive session ended at 4:45 p.m. and the Commission reconvened in open session.

During the Bank of North Dakota executive session, the Commission made a motion related to approval of two loan applications.

On a roll call vote, Governor Burgum, Attorney General Wrigley, and Commissioner Goehring voted aye. The motion carried unanimously.

Being no further business, Governor Burgum adjourned the meeting of the Industrial Commission at 6:00 p.m.

North Dakota Industrial Commission

Brenna Jessen, Recording Secretary

Reice Haase, Deputy Executive Director

Karen Tyler, Interim Executive Director

CONSULTING SERVICES AGREEMENT
NORTH DAKOTA PIPELINE AUTHORITY

THIS AGREEMENT is made and entered into as of July 1, 2023, between the North Dakota Industrial Commission in its role as the North Dakota Pipeline Authority (“Commission”), and Terra Resources (“Contractor”) whose address is P. O. Box 855, Bismarck, North Dakota.

WHEREAS, the State of North Dakota through legislation adopted in 2007 has established the North Dakota Pipeline Authority (“NDPA”) to diversify and expand the North Dakota economy by facilitating development of pipeline facilities to support the production, transportation and utilization of North Dakota energy-related commodities, thereby increasing employment, stimulating economic activity, augmenting sources of tax revenue, fostering economic stability, and improving the state’s economy.

WHEREAS, the Commission is interested in contracting with Contractor to provide the professional services required by the Commission to implement the work of the NDPA and Contractor agrees to provide the requested professional services.

NOW, THEREFORE, in consideration of the foregoing and the mutual covenants and conditions contained herein, and subject to the approval of the Commission as required below, the parties hereby agree as follows:

1.0 **INDEPENDENT CONTRACTOR**

Consultant shall perform the services specified in this Agreement as an independent contractor and not as an employee of the Commission. No part of this Agreement shall be construed as creating an employer/employee relationship between the Commission and the Contractor. As an independent contractor, Contractor shall be responsible for his own payroll related taxes and insurances and covenants that he will pay the same when due.

2.0 **TERM**

The term of this contract shall be for a total of up to twenty-four months or upon completion of the work required under the NDPA, whichever first occurs, with a review at the end of twelve months.

3.0 **SCOPE OF WORK**

Contractor shall provide promotional, development and technical professional services required by the Commission for the successful operation of the NDPA. The services shall include, but are not limited to, the following:

- 1) Provide and maintain statewide crude oil, natural gas, and natural gas liquids production forecasts;
- 2) Provide statewide drilling economics analysis each quarter;
- 3) Publish monthly updates which will include the following information:
 - Percentage estimates for U.S. Williston Basin crude oil export transportation modes
 - Statewide natural gas flaring statistics and categories (non-confidential production only)
 - Estimated statewide crude by rail transportation
 - Canadian imports/exports data
 - Statewide natural gas gathering connections
 - U.S. Williston Basin oil production statistics (ND, MT, & SD)
 - U.S. Williston Basin drilling rig snapshot
 - Snapshot of crude oil and natural gas pricing;
- 4) Maintain and update major crude oil transportation project details;
- 5) Maintain and update natural gas processing plant and transmission pipeline capacity details;
- 6) Maintain and update statewide transmission pipeline maps;
- 7) Provide county level crude oil gathering details annually as data is available (truck vs pipeline gathering);

- 8) Provide quarterly updates to the Industrial Commission in its role as the Pipeline Authority;
- 9) Provide updates/presentations as requested to the North Dakota Oil and Gas Research Council;
- 10) Provide updates on the above items to the North Dakota Legislature and legislative interim committees as necessary;
- 11) Participate in monthly press events outlining information from the above deliverables;
- 12) Serve in an advisory role on the EmPower ND Commission;
- 13) Serve as a non-voting member and technical expert on the Clean Sustainable Energy Authority;
- 14) Participate on additional working groups and committees as mutually agreed upon;
- 15) Answer questions from the public, media and industry on any of the above deliverables;
- 16) Make presentations before group meetings which may include but not limited to the Williston Basin Petroleum Conference and Prospect Expo, the North Dakota Petroleum Council Annual Meeting, and other groups as mutually agreed upon by the Contractor and the Commission;
- 17) Facilitate meetings between industry participants;
- 18) Maintain and update a website for the NDPA and developing additional content as needed;
- 19) Prepare information for distribution on a quarterly basis for a newsletter regarding activities of the NDPA and pipeline activities in the state, if needed, or provide recorded presentations and maintain a distribution list of interested parties;
- 20) Assist with the development of projects that meet the mission of the NDPA;
- 21) Participate in meetings with state officials and other interested parties to provide information and gain information on energy-related pipeline activities and potential projects that may need pipelines and related pipeline facilities;
- 22) Perform and complete any other duties as assigned for the benefit of the NDPA and as mutually agreed upon by the Contractor and the Commission;
- 23) Provide forecasting information on oil and gas production to the Office of Management and Budget and their revenue forecasting consultant;
- 24) Provide engineering services to the Department of Commerce for analysis as requested in regard to companies wanting to do energy related work in North Dakota with a special focus on development of value-added natural gas projects.
- 25) Provide information to the Department of Mineral Resources staff on energy-related transportation issues.
- 26) Oversee the opportunities and management of any pipeline capacity positions for the advancement of NDPA goals.

4.0 COMPENSATION

For all services rendered by the Contractor pursuant to this Agreement, the Contractor shall be paid \$14,672 a month. This rate is intended to include all of the Contractor's general overhead expense, including, but not limited to, the following: rent; office equipment; postage; e-mail; home office secretarial service; local telephone and fax; local travel and meals; employment taxes; insurance; etc. The Commission shall make payment on a monthly basis upon receipt of the Contractor's invoice and report of work completed the prior month.

In addition to the above-specified monthly rate, Contractor shall be separately reimbursed for extraordinary expenses incurred in connection with the performance of this Agreement and as directed by the Industrial Commission Executive Director in consultation with the NDPA management team. The Contractor shall invoice the Commission for the extraordinary expenses incurred during the preceding two weeks. Extraordinary expenses shall include both in and out of state travel either by car or commercial transportation. Copies of receipts must be provided for any expense items in excess of \$25. The Contractor shall be reimbursed at the same rate for meals and lodging as is paid to State employees.

5.0 REPORTING

Contractor shall provide a written report prior to a payment for professional services being made that outline what work activities were completed. The Contractor shall also provide such other oral and written reports as the Commission or the Executive Director from time-to-time may require. The primary contact with the Commission shall be with the Commission's Executive Director who may seek the assistance of the President of the North Dakota Petroleum Council and the Director of the Department of Mineral Resources. Further, the Contractor shall regularly meet with the Executive Director, either in person or by phone, as the Executive Director determines is necessary to discuss the project objectives, goals, and milestones and shall be available to meet and provide reports to the Oil and Gas Research Council and the Commission.

6.0 LIMITED AUTHORITY

Contractor shall have no authority to bind the Commission to any contractual arrangements and is not an agent of the Commission for any purpose.

7.0 DATA AND WORK PRODUCT

All data, notes, memoranda, reports, and other work product, of any kind or nature, developed by Contractor pursuant to this Agreement shall be the exclusive property of the Commission. Contractor may not use the data, notes, memoranda, reports, or other work product developed by the Contractor for any purpose other than completion of the scope of work contemplated by this Agreement. Upon termination of this Agreement, all data, notes, memoranda, reports, and other work product remaining in the possession of the Contractor shall be turned over to the Commission.

From time-to-time, Contractor may be provided with confidential reports, data, and work product developed by others for the Commission and/or the State of North Dakota. Contractor may not disclose this confidential work product to third parties without the written permission of the Commission and this work product shall at all times remain the exclusive work product of the Commission. At the termination of this Agreement, all such work product shall be returned to the Commission.

8.0 ASSIGNMENT AND SUBCONTRACTING

Contractor may not assign or delegate any portion of this Agreement, nor may Contractor subcontract for the performance of any portion of this Agreement without the prior written consent of the Commission. The Commission agrees to provide funding for retaining technical expertise in website construction and website development. The amount of funding to be provided shall be determined by the Industrial Commission Executive Director.

9.0 CANCELLATION FOR CONVENIENCE

The Commission shall have the right to terminate this Agreement at any time and for any reason upon 30 days written notice to the Contractor, which notice shall set forth the effective date for the termination. On the termination date specified in the notice, Contractor shall discontinue all work pertaining to this Agreement. Upon termination, Contractor shall be entitled to payment for all earned services up to the termination date, and payment for all un-reimbursed expenses properly incurred in accordance with this Agreement. The Contractor shall have the right to terminate this Agreement at any time and for any reason upon 30 days written notice to the Commission, which notice shall set forth the effective date for the termination. On the termination date specified in the notice or such date mutually agreed upon by the Commission and Contractor if less than 30 days, the Contractor shall discontinue all work pertaining to this Agreement.

10.0 NDIC ETHICS POLICY AND CONFLICTS OF INTEREST

For all services rendered by the Contractor pursuant to this agreement the Contractor is subject to the Commission Ethics Policy. Contractor may not engage in other work in North Dakota during the term of this Agreement that competes or creates a conflict-of-interest with the accomplishment of the goals and objectives of the North Dakota Pipeline Authority. The Industrial Commission Executive Director may grant written approval of other work by the Contractor in North Dakota upon the written request of the Contractor. The Commission does not object to consulting work that the Contractor may do for other state agencies. The Commission does not object to the services the Contractor provides as an adjunct professor at Bismarck State College's Petroleum Production Technology Program.

11.0 FORCE MAJEURE

Neither Party shall be held responsible for delay or default caused by fire, riot, terrorism, pandemic (excluding COVID-19), acts of God, or war if the event was not foreseeable through the exercise of reasonable diligence by the affected Party, the event is beyond the Party's reasonable control, and the affected Party gives notice to the other Party promptly upon occurrence of the event causing the delay or default or that is reasonably expected to cause a delay or default. If Contractor is the affected Party and does not resume performance within fifteen (15) days or another period agreed between the Parties, then State may seek all available remedies, up to and including termination of this Contract pursuant to its Termination Section, and State shall be entitled to a pro-rata refund of any amounts paid for which the full value has not been realized.

12.0 INDEMNIFICATION

Contractor agrees to defend, indemnify, and hold harmless the State of North Dakota, its agencies, officers and employees (State of ND), from and against claims based on the vicarious liability of State of ND or its agents, but not against claims based on the State of ND's contributory negligence, comparative and/or contributory negligence or fault, sole negligence, or intentional misconduct. This obligation to defend, indemnify, and hold harmless does not extend to professional liability claims arising from professional errors and omissions. The legal defense provided by Contractor to State of ND under this provision must be free of any conflicts of interest, even if retention of separate legal counsel for State of ND is necessary. Any attorney appointed to represent the State must first qualify as and be appointed by the North Dakota Attorney General as a Special Assistant Attorney General as required under N.D.C.C. 54-12-08. Contractor also agrees to defend, indemnify, and hold State harmless for all costs, expenses and attorneys' fees incurred if State of ND prevails in an action against Contractor in establishing and litigating the indemnification coverage provided herein. This obligation shall continue after the termination of this Contract.

13.0 CONFIDENTIALITY

Contractor shall not use or disclose any information it receives from State under this Contract that State has previously identified as confidential or exempt from mandatory public disclosure except as necessary to carry out the purposes of this Contract or as authorized in advance by State. State shall not disclose any information it receives from Contractor that Contractor has previously identified as confidential and that State determines in its sole discretion is protected from mandatory public disclosure under a specific exception to the North Dakota public records law, N.D.C.C. ch. 44-04. The duty of State and Contractor to maintain confidentiality of information under this section continues beyond the Term of this Contract.

14.0 COMPLIANCE WITH PUBLIC RECORDS LAWS

Under the North Dakota public records law and subject to the Confidentiality clause of this Contract, certain records may be open to the public upon request.

Public records may include: (a) records State receives from Contractor under this Contract, (b) records obtained by either Party under this Contract, and (c) records generated by either Party under this Contract.

Contractor agrees to contact State immediately upon receiving a request for information under the public records law and to comply with State's instructions on how to respond to such request.

15.0 INDEPENDENT ENTITY

Contractor is an independent entity under this Contract and is not a State employee for any purpose, including the application of the Social Security Act, the Fair Labor Standards Act, the Federal Insurance Contribution Act, the North Dakota Unemployment Compensation Law and the North Dakota Workforce Safety and Insurance Act. Contractor retains sole and absolute discretion in the manner and means of carrying out Contractor's activities and responsibilities under this Contract, except to the extent specified in this Contract.

16.0 SPOILIATION – PRESERVATION OF EVIDENCE

Contractor shall promptly notify State of all potential claims that arise or result from this Contract. Contractor shall also take all reasonable steps to preserve all physical evidence and information that may be relevant to the circumstances surrounding a potential claim, while maintaining public safety, and grants to State the opportunity to review and inspect such evidence, including the scene of an accident.

17.0 MERGER AND MODIFICATION, CONFLICT IN DOCUMENTS

This Contract, including the following documents, constitutes the entire agreement between the Parties. There are no understandings, agreements, or representations, oral or written, not specified within this Contract. This Contract may not be modified, supplemented or amended, in any manner, except by written agreement signed by both Parties.

18.0 SEVERABILITY

If any term of this Contract is declared to be illegal or unenforceable by a court having competent jurisdiction, the validity of the remaining terms is unaffected and, if possible, the rights and obligations of the Parties are to be construed and enforced as if this Contract did not contain that term.

19.0 APPLICABLE LAW AND VENUE

This Contract is governed by and construed in accordance with the laws of the State of North Dakota. Any action to enforce this Contract must be adjudicated exclusively in the state District Court of Burleigh County, North Dakota. Each Party consents to the exclusive jurisdiction of such court and waives any claim of lack of jurisdiction or *forum non conveniens*.

20.0 ALTERNATIVE DISPUTE RESOLUTION – JURY TRIAL

By entering this Contract, State does not agree to binding arbitration, mediation, or any other form of mandatory Alternative Dispute Resolution. The Parties may enforce the rights and remedies in judicial proceedings. State does not waive any right to a jury trial.

21.0 ATTORNEY FEES

In the event a lawsuit is instituted by State to obtain performance due under this Contract, and State is the prevailing Party, Contractor shall, except when prohibited by N.D.C.C. § 28 26 04, pay State's reasonable attorney fees and costs in connection with the lawsuit.

22.0 NONDISCRIMINATION AND COMPLIANCE WITH LAWS

Contractor agrees to comply with all applicable federal and state laws, rules, and policies, including those relating to nondiscrimination, accessibility, and civil rights. (See N.D.C.C. Title 34 – Labor and Employment, specifically N.D.C.C. ch. 34-06.1 Equal Pay for Men and Women.)

Contractor agrees to timely file all required reports, make required payroll deductions, and timely pay all taxes and premiums owed, including sales and use taxes, unemployment compensation and workers' compensation premiums.

Contractor shall have and keep current all licenses and permits required by law during the Term of this Contract.

Contractor is prohibited from boycotting Israel for the duration of this Contract. (See N.D.C.C § 54-44.4-15.) Contractor represents that it does not and will not engage in a boycotting Israel during the term of this Contract. If State receives evidence that Contractor boycotts Israel, State shall determine whether the company boycotts Israel. The foregoing does not apply to contracts with a total value of less than \$100,000 or if Contractor has fewer than ten (10) full-time employees.

Contractor's failure to comply with this section may be deemed a material breach by Contractor entitling State to terminate in accordance with the Termination for Cause section of this Contract.

23.0 STATE AUDIT

Pursuant to N.D.C.C. § 54-10-19, all records, regardless of physical form, and the accounting practices and procedures of Contractor relevant to this Contract are subject to examination by the North Dakota State Auditor, the Auditor's designee, or Federal auditors, if required. Contractor shall maintain these records for at least three (3) years following completion of this Contract and be able to provide them upon reasonable notice. State, State Auditor, or Auditor's designee shall provide reasonable notice to Contractor prior to conducting examination.

24.0 COUNTERPARTS

This Contract may be executed in multiple, identical counterparts, each of which is be deemed an original, and all of which taken together shall constitute one and the same contract.

25.0 EFFECTIVENESS OF CONTRACT

This Contract is not effective until fully executed by both Parties. If no start date is specified in the Term of Contract, the most recent date of the signatures of the Parties shall be deemed the Effective Date.

IN WITNESS WHEREOF, the parties have caused this Agreement to be entered into as of the date first above written.

**INDUSTRIAL COMMISSION
OF NORTH DAKOTA**

TERRA RESOURCES

By _____
Karen Tyler
Industrial Commission
Interim Executive Director

By _____
Justin Joseph Kringstad

CONSULTING SERVICES AGREEMENT
NORTH DAKOTA TRANSMISSION AUTHORITY

THIS AGREEMENT is made and entered into as of August 1, 2023, between the North Dakota Industrial Commission in its role as the North Dakota Transmission Authority (“Commission”), and Missouri River Grid Consultants (“Contractor”) whose address is 8426 Norman Place, Bismarck, North Dakota.

WHEREAS, the State of North Dakota through legislation adopted in 2005 has established the North Dakota Transmission Authority (“NDTA”) to facilitate the development of transmission infrastructure in North Dakota. The Authority was established to serve as a catalyst for new investment in transmission by facilitating, financing, developing and/or acquiring transmission to accommodate new lignite and wind energy development.

WHEREAS, the Commission is interested in contracting with Contractor to provide the professional services required by the Commission to implement the work of the NDTA and Contractor agrees to provide the requested professional services.

NOW, THEREFORE, in consideration of the foregoing and the mutual covenants and conditions contained herein, and subject to the approval of the Commission as required below, the parties hereby agree as follows:

1.0 **INDEPENDENT CONTRACTOR**

Consultant shall perform the services specified in this Agreement as an independent contractor and not as an employee of the Commission. No part of this Agreement shall be construed as creating an employer/employee relationship between the Commission and the Contractor. As an independent contractor, Contractor shall be responsible for his own payroll related taxes and insurances and covenants that he will pay the same when due.

2.0 **TERM**

The term of this contract shall be for a total of up to twenty-three months or upon completion of the work required under the NDTA, whichever first occurs, with a review at the end of the first fiscal year of the biennium.

3.0 **SCOPE OF WORK**

Contractor shall provide promotional, development and technical professional services required by the Commission for the successful operation of the NDTA. The services shall include, but are not limited to, the following:

- a. Attending meetings (in person or by electronic means) related to state, regional or national electric transmission planning efforts, including but not limited to:
 - i. MISO committees focusing on issues of specific interest to North Dakota
 - ii. Southern Power Pool (SPP) committees focusing on issues of specific interest to North Dakota
 - iii. Midwest Reliability Organization
- b. Establish and maintain open relationships with incumbent electric transmission utilities and new project developers.
- c. Make presentations related to NDTA, as requested, to interim legislative committees, association and industry partners
- d. EmPower ND Commission
 - i. Serve as transmission representative.
 - ii. Attend meetings; develop energy policy for State of ND.
- e. Clean Sustainable Energy Authority

- i. Serve on technical review committee
- f. Assist with the development of projects that meet the mission of the NDTA.
- g. Participate in meetings with state officials and other interested parties to provide information and acquire information related to transmission activities and potential projects of interest to the NDTA.
- h. Send summary monthly reports to the Executive Director/Deputy Director
- i. Share monthly reports with the ND PSC, interested State Agencies, related trade associations and incumbent utilities.
- j. Responsibilities also include communication of transmission activities in the biannual status reports to be incorporated in the overall reporting of the EPP program, preparation of the NDTA annual report and the Annual Resilience of the Electric Grid in ND.
- k. Respond to inquiries from constituents and members of the news media.
- l. Manage the DOE Grid Resilience grant process, solicit award applicants, manage award process and provide supporting information.
- m. Perform and complete any other duties as assigned for the benefit of the NDTA and as mutually agreed upon by Claire and the ND Industrial Commission.

4.0 COMPENSATION

For all services rendered by the Contractor pursuant to this Agreement, the Contractor shall be paid \$12,500.00 a month. This rate is intended to include all of the Contractor's general overhead expense, which could include, but not be limited to, the following: rent; office equipment; postage; e-mail; home office expenses; cellular phone service; travel and meals; employment taxes; insurance; etc. The Commission shall make payment on a monthly basis upon receipt of the Contractor's invoice and report of work completed the prior month.

5.0 REPORTING

Contractor shall provide a written report prior to a payment for professional services being made that outline what work activities were completed. The Contractor shall also provide such other oral and written reports as the Commission or the Executive Director from time-to-time may require. The primary contact with the Commission shall be with the Commission's Executive Director. Further, the Contractor shall regularly meet with the Executive Director, either in person or by phone, as the Executive Director determines is necessary to discuss the project objectives, goals, and milestones and shall be available to meet and provide reports to the Commission.

6.0 LIMITED AUTHORITY

Contractor shall have no authority to bind the Commission to any contractual arrangements and is not an agent of the Commission for any purpose.

7.0 DATA AND WORK PRODUCT

All data, notes, memoranda, reports, and other work product, of any kind or nature, developed by Contractor pursuant to this Agreement shall be the exclusive property of the Commission. Contractor may not use the data, notes, memoranda, reports, or other work product developed by the Contractor for any purpose other than completion of the scope of work contemplated by this Agreement. Upon termination of this Agreement,

all data, notes, memoranda, reports, and other work product remaining in the possession of the Contractor shall be turned over to the Commission.

From time-to-time, Contractor may be provided with confidential reports, data, and work product developed by others for the Commission and/or the State of North Dakota. Contractor may not disclose this confidential work product to third parties without the written permission of the Commission and this work product shall at all times remain the exclusive work product of the Commission. At the termination of this Agreement, all such work product shall be returned to the Commission.

8.0 ASSIGNMENT AND SUBCONTRACTING

Contractor may not assign or delegate any portion of this Agreement, nor may Contractor subcontract for the performance of any portion of this Agreement without the prior written consent of the Commission. The Commission agrees to provide funding for retaining technical expertise in website construction and website development. The amount of funding to be provided shall be determined by the Industrial Commission Executive Director.

9.0 CANCELLATION FOR CONVENIENCE

The Commission shall have the right to terminate this Agreement at any time and for any reason upon 30 days written notice to the Contractor, which notice shall set forth the effective date for the termination. On the termination date specified in the notice, Contractor shall discontinue all work pertaining to this Agreement. Upon termination, Contractor shall be entitled to payment for all earned services up to the termination date, and payment for all un-reimbursed expenses properly incurred in accordance with this Agreement. The Contractor shall have the right to terminate this Agreement at any time and for any reason upon 30 days written notice to the Commission, which notice shall set forth the effective date for the termination. On the termination date specified in the notice or such date mutually agreed upon by the Commission and Contractor if less than 30 days, the Contractor shall discontinue all work pertaining to this Agreement.

10.0 NDIC ETHICS POLICY AND CONFLICTS OF INTEREST

For all services rendered by the Contractor pursuant to this agreement the Contractor is subject to the Commission Ethics Policy. Contractor may not engage in other work in North Dakota during the term of this Agreement that competes or creates a conflict-of-interest with the accomplishment of the goals and objectives of the North Dakota Transmission Authority. The Industrial Commission Executive Director may grant written approval of other work by the Contractor in North Dakota upon the written request of the Contractor. The Commission does not object to consulting work that the Contractor may do for other state agencies.

11.0 FORCE MAJEURE

Neither Party shall be held responsible for delay or default caused by fire, riot, terrorism, pandemic (excluding COVID-19), acts of God, or war if the event was not foreseeable through the exercise of reasonable diligence by the affected Party, the event is beyond the Party's reasonable control, and the affected Party gives notice to the other Party promptly upon occurrence of the event causing the delay or default or that is reasonably expected to cause a delay or default. If Contractor is the affected Party and does not resume performance within fifteen (15) days or another period agreed between the Parties, then State may seek all available remedies, up to and including termination of this Contract pursuant to its Termination Section, and State shall be entitled to a pro-rata refund of any amounts paid for which the full value has not been realized.

12.0 INDEMNIFICATION

Contractor agrees to defend, indemnify, and hold harmless the State of North Dakota, its agencies, officers and employees (State of ND), from and against claims based on the vicarious liability of State of ND or its agents, but not against claims based on the State of ND's contributory negligence, comparative and/or contributory negligence or fault, sole negligence, or intentional misconduct. This obligation to defend, indemnify, and hold harmless does not extend to professional liability claims arising from professional errors and omissions. The legal defense provided by Contractor to State of ND under this provision must be free of any conflicts of interest, even if retention of separate legal counsel for State of ND is necessary. Any attorney appointed to represent the State must first qualify as and be appointed by the North Dakota Attorney General as a Special Assistant Attorney General as required under N.D.C.C. 54-12-08. Contractor also agrees to defend, indemnify, and hold State harmless for all costs, expenses and attorneys' fees incurred if State of ND prevails in an action against Contractor in establishing and litigating the indemnification coverage provided herein. This obligation shall continue after the termination of this Contract.

13.0 CONFIDENTIALITY

Contractor shall not use or disclose any information it receives from State under this Contract that State has previously identified as confidential or exempt from mandatory public disclosure except as necessary to carry out the purposes of this Contract or as authorized in advance by State. State shall not disclose any information it receives from Contractor that Contractor has previously identified as confidential and that State determines in its sole discretion is protected from mandatory public disclosure under a specific exception to the North Dakota public records law, N.D.C.C. ch. 44-04. The duty of State and Contractor to maintain confidentiality of information under this section continues beyond the Term of this Contract.

14.0 COMPLIANCE WITH PUBLIC RECORDS LAWS

Under the North Dakota public records law and subject to the Confidentiality clause of this Contract, certain records may be open to the public upon request.

Public records may include: (a) records State receives from Contractor under this Contract, (b) records obtained by either Party under this Contract, and (c) records generated by either Party under this Contract.

Contractor agrees to contact State immediately upon receiving a request for information under the public records law and to comply with State's instructions on how to respond to such request.

15.0 INDEPENDENT ENTITY

Contractor is an independent entity under this Contract and is not a State employee for any purpose, including the application of the Social Security Act, the Fair Labor Standards Act, the Federal Insurance Contribution Act, the North Dakota Unemployment Compensation Law and the North Dakota Workforce Safety and Insurance Act. Contractor retains sole and absolute discretion in the manner and means of carrying out Contractor's activities and responsibilities under this Contract, except to the extent specified in this Contract.

16.0 SPOLIATION – PRESERVATION OF EVIDENCE

Contractor shall promptly notify State of all potential claims that arise or result from this Contract. Contractor shall also take all reasonable steps to preserve all physical evidence and information that may be relevant to the circumstances surrounding a potential claim, while maintaining public safety, and grants to State the opportunity to review and inspect such evidence, including the scene of an accident.

17.0 MERGER AND MODIFICATION, CONFLICT IN DOCUMENTS

This Contract, including the following documents, constitutes the entire agreement between the Parties. There are no understandings, agreements, or representations, oral or written, not specified within this Contract. This Contract may not be modified, supplemented or amended, in any manner, except by written agreement signed by both Parties.

18.0 SEVERABILITY

If any term of this Contract is declared to be illegal or unenforceable by a court having competent jurisdiction, the validity of the remaining terms is unaffected and, if possible, the rights and obligations of the Parties are to be construed and enforced as if this Contract did not contain that term.

19.0 APPLICABLE LAW AND VENUE

This Contract is governed by and construed in accordance with the laws of the State of North Dakota. Any action to enforce this Contract must be adjudicated exclusively in the state District Court of Burleigh County, North Dakota. Each Party consents to the exclusive jurisdiction of such court and waives any claim of lack of jurisdiction or *forum non conveniens*.

20.0 ALTERNATIVE DISPUTE RESOLUTION – JURY TRIAL

By entering this Contract, State does not agree to binding arbitration, mediation, or any other form of mandatory Alternative Dispute Resolution. The Parties may enforce the rights and remedies in judicial proceedings. State does not waive any right to a jury trial.

21.0 ATTORNEY FEES

In the event a lawsuit is instituted by State to obtain performance due under this Contract, and State is the prevailing Party, Contractor shall, except when prohibited by N.D.C.C. § 28 26 04, pay State's reasonable attorney fees and costs in connection with the lawsuit.

22.0 NONDISCRIMINATION AND COMPLIANCE WITH LAWS

Contractor agrees to comply with all applicable federal and state laws, rules, and policies, including those relating to nondiscrimination, accessibility, and civil rights. (See N.D.C.C. Title 34 – Labor and Employment, specifically N.D.C.C. ch. 34-06.1 Equal Pay for Men and Women.)

Contractor agrees to timely file all required reports, make required payroll deductions, and timely pay all taxes and premiums owed, including sales and use taxes, unemployment compensation and workers' compensation premiums.

Contractor shall have and keep current all licenses and permits required by law during the term of this Contract.

Contractor is prohibited from boycotting Israel for the duration of this Contract. (See N.D.C.C § 54-44.4-15.) Contractor represents that it does not and will not engage in a boycotting Israel during the term of this Contract. If State receives evidence that Contractor boycotts Israel, State shall determine whether the company boycotts Israel. The foregoing does not apply to contracts with a total value of less than \$100,000 or if Contractor has fewer than ten (10) full-time employees.

Contractor's failure to comply with this section may be deemed a material breach by Contractor entitling State to terminate in accordance with the Termination for Cause section of this Contract.

23.0 STATE AUDIT

Pursuant to N.D.C.C. § 54-10-19, all records, regardless of physical form, and the accounting practices and procedures of Contractor relevant to this Contract are subject to examination by the North Dakota State Auditor, the Auditor's designee, or Federal auditors, if required. Contractor shall maintain these records for at least three (3) years following completion of this Contract and be able to provide them upon reasonable notice. State, State Auditor, or Auditor's designee shall provide reasonable notice to Contractor prior to conducting examination.

24.0 COUNTERPARTS

This Contract may be executed in multiple, identical counterparts, each of which is be deemed an original, and all of which taken together shall constitute one and the same contract.

25.0 EFFECTIVENESS OF CONTRACT

This Contract is not effective until fully executed by both Parties. If no start date is specified in the Term of Contract, the most recent date of the signatures of the Parties shall be deemed the Effective Date.

IN WITNESS WHEREOF, the parties have caused this Agreement to be entered into as of the date first above written.

**INDUSTRIAL COMMISSION
OF NORTH DAKOTA**

Missouri River Grid Consultants

By _____
Karen Tyler
Industrial Commission
Interim Executive Director

By _____
Claire Vigesaa

CONSULTING SERVICES AGREEMENT
LIGNITE RESEARCH DEVELOPMENT AND MARKETING PROGRAM

THIS AGREEMENT is made and entered into as of _____, between the State of North Dakota (State) acting by and through its Industrial Commission (“Commission”) and _____ (“Contractor”) whose address is _____, North Dakota.

WHEREAS, the State through legislation adopted in 1987 has established the North Dakota Lignite Research, Development and Marketing Program (LRP) to assist with the development and wise use of North Dakota's vast lignite resources and to promote the economic, efficient, and clean uses of lignite and products derived from lignite in order to maintain and enhance development of North Dakota lignite and its products; support educational activities relating to the lignite industry; preserve and create jobs involved in the production and utilization of North Dakota lignite; ensure economic stability, growth, and opportunity in the lignite industry; and maintain a stable and competitive tax base for our state's lignite industry for the general welfare of North Dakota.

WHEREAS, the Commission is interested in contracting with Contractor to provide the professional services required by the Commission to implement the work of the LRP and Contractor agrees to provide the requested professional services.

NOW, THEREFORE, in consideration of the foregoing and the mutual covenants and conditions contained herein, and subject to the approval of the Commission as required below, the parties hereby agree as follows:

1.0 INDEPENDENT CONTRACTOR

Contractor shall perform the services specified in this Agreement as an independent contractor and not as an employee of the Commission. No part of this Agreement shall be construed as creating an employer/employee relationship between the Commission and the Contractor. As an independent contractor, Contractor shall be responsible for payroll related taxes and insurances and covenants that will be paid when due.

2.0 TERM

The effective date of this contract is July 1, 2024. The term of this contract shall be for a total of up to twelve months or upon completion of the work required under the LRP, whichever first occurs, with a review at the end of twelve months.

3.0 SCOPE OF WORK

Contractor shall provide technical professional services required by the Commission for the successful administration of the LRP. Specific responsibilities include, but are not limited to, the following:

1. Assists with the development of strategy(ies) and implementation plan(s) to facilitate development of priority opportunities to enhance the development and use of North Dakota lignite as directed in the program.
2. Maintains knowledge of laws, regulations, policies and guidelines related to the program. Communicates accurate interpretations and requirements to project applicants, to the Lignite Research Council and to the Commission.
3. Performs administrative duties and is responsible for planning and program development to ensure a cost-effective program. Reviews regular and special reports related to projects and handles correspondence as necessary. Supplies prospective applicants with necessary application information, rules and regulations and any other pertinent information related to the application and review process.

4. Ensures compliance with program requirements and coordinates completeness review of all application submittals for the Lignite Research Council and the Commission. Ensures that all applications meet regulatory requirements and communicates with applicants as appropriate.
5. Recommends selection of and communicates with qualified Independent Technical Peer Reviewers and coordinates the recommendation and comments of the peer reviewers of projects, proposed projects and proposals. Establishes schedules for peer review, collects comments and establishes peer review committees as necessary to develop reports and recommendations to the Lignite Research Council and Commission. Ensures independent and credible analysis of potential projects and projects to insure:
 - a. Technical merit
 - b. Application to North Dakota lignite
 - c. Marketability
 - d. Economic feasibility
 - e. Prospect for rapid commercialization
 - f. Likelihood for attracting private matching funds
 - g. Potential for preserving existing lignite production and jobs or generating additional production and economic growth
6. Assists with negotiation of contracts with successful project applicants as needed and monitors contracts to ensure compliance with Commission policies and procedures. Responsible for monitoring all funded projects. Reports on a regular basis to the Commission on the status of the funded projects.
7. Assists with development of financial recommendations for individual projects and with implementation of financing proposals by working with project partners, the state, and the federal government. Identifies specific sources of cost sharing revenue for potential projects. Works to maximize the availability of private, state, and federal funds for potential lignite research and development projects.
8. Ensures timely filing of all required reports and prepares and coordinates the preparation of regulatory or special reports as required by contract, laws, and rules or at the request of the Commission. Communicates with prospective and successful applicants about the requirements of reports.
9. Assists the Commission with promotion of lignite-based energy conversion projects through Advanced Energy Technology and related demonstration projects.
10. Assists the Commission with lignite-based Research and Development opportunities with the U.S. Department of Energy.
11. Performs other duties as assigned by the Commission.

4.0 COMPENSATION

For all services rendered by the Contractor pursuant to this Agreement, the Contractor shall be paid _____ per month. This rate is intended to include all of the Contractor's general overhead expense, including, but not limited to, the following: rent; office equipment; postage; e-mail; home office secretarial service; local telephone and fax; local travel and meals; employment taxes; insurance; etc. The Commission shall make payment on a monthly basis upon receipt of the Contractor's invoice and report of work completed for the invoice period.

In addition to the above-specified monthly rate, Contractor shall be separately reimbursed for travel and other extraordinary expenses incurred in connection with the performance of this Agreement and as directed by the Commission. The Contractor shall itemize expenses incurred during the invoice period. The Contractor shall be reimbursed at the same rate for meals and lodging as is paid to State employees.

5.0 REPORTING

Contractor shall provide a written report prior to a payment for professional services being made that outline what work activities were completed in the invoice period. The Contractor shall also provide such other oral and written reports as the Commission from time-to-time may require. Further, the Contractor shall regularly meet with the Office of the Industrial Commission, either in person or by phone, as the Office determines is necessary to discuss the project objectives, goals, and milestones and shall be available to meet and provide reports to the Lignite Research Council and the Commission.

6.0 LIMITED AUTHORITY

Contractor shall have no authority to bind the Commission to any contractual arrangements and is not an agent of the Commission for any purpose.

7.0 DATA AND WORK PRODUCT

All data, notes, memoranda, reports, and other work product, of any kind or nature, developed by Contractor pursuant to this Agreement shall be the exclusive property of the Commission. Contractor may not use the data, notes, memoranda, reports, or other work product developed by the Contractor for any purpose other than completion of the scope of work contemplated by this Agreement. Upon termination of this Agreement, all data, notes, memoranda, reports, and other work product remaining in the possession of the Contractor shall be turned over to the Commission.

From time-to-time, Contractor may be provided with confidential reports, data, and work product developed by others for the Commission and/or the State of North Dakota. Contractor may not disclose this confidential work product to third parties without the written permission of the Commission and this work product shall at all times remain the exclusive work product of the Commission. At the termination of this Agreement, all such work product shall be returned to the Commission.

8.0 ASSIGNMENT AND SUBCONTRACTING

Contractor may not assign or otherwise transfer or delegate any right or duty without State's express written consent, provided, however, that Contractor may assign its rights and obligations hereunder in the event of a change of control or sale of all or substantially all of its assets related to this Contract, whether by merger, reorganization, operation of law, or otherwise. Should Assignee be a business or entity with whom State is prohibited from conducting business, State shall have the right to terminate in accordance with the Termination for Cause section of this Contract.

Contractor may enter subcontracts provided that any subcontract acknowledges the binding nature of this Contract and incorporates this Contract, including any attachments. Contractor is solely responsible for the performance of any subcontractor with whom Contractor contracts. Contractor does not have authority to contract for or incur obligations on behalf of State.

9.0 CANCELLATION FOR CONVENIENCE

The Commission shall have the right to terminate this Agreement at any time and for any reason upon 30 days written notice to the Contractor, which notice shall set forth the effective date for the termination. On the termination date specified in the notice, Contractor shall discontinue all work pertaining to this Agreement. Upon termination, Contractor shall be entitled to payment for all earned services up to the termination date, and payment for all reimbursable expenses properly incurred in accordance with this Agreement. The Contractor shall have the right to terminate this Agreement at any time and for any reason upon 30 days written notice to the Commission, which notice shall set forth the effective date for the termination. On the termination date specified in the notice or such date mutually agreed upon by the Commission and Contractor if less than 30 days, the Contractor shall discontinue all work pertaining to this Agreement.

10.0 NDIC ETHICS POLICY AND CONFLICTS OF INTEREST

For all services rendered by the Contractor pursuant to this agreement the Contractor is subject to the Commission Ethics Policy. Contractor may not engage in other work in North Dakota during the term of this Agreement that competes or creates a conflict-of-interest with the accomplishment of the goals and objectives of the North Dakota Lignite Research, Development and Marketing Program. The Industrial Commission may grant written approval of other work by the Contractor in North Dakota upon the written request of the Contractor. The Commission acknowledges and does not object to Contractor's position as the Vice President of the Lignite Energy Council (LEC), provided that it does not conflict with the Contractor's obligations under this contract to the Commission, that the Contractor declare a conflict to the Commission for all applications by the LEC to the LRP, and that the Contractor refrain from providing administrative and technical advisory services related to LEC applications to the LRP.

11.0 FORCE MAJEURE

Neither Party shall be held responsible for delay or default caused by fire, riot, terrorism, pandemic (excluding COVID-19), acts of God, or war if the event was not foreseeable through the exercise of reasonable diligence by the affected Party, the event is beyond the Party's reasonable control, and the affected Party gives notice to the other Party promptly upon occurrence of the event causing the delay or default or that is reasonably expected to cause a delay or default. If Contractor is the affected Party and does not resume performance within fifteen (15) days or another period agreed between the Parties, then State may seek all available remedies, up to and including termination of this Contract pursuant to its Termination Section, and State shall be entitled to a pro-rata refund of any amounts paid for which the full value has not been realized.

12.0 INDEMNIFICATION

Contractor agrees to defend, indemnify, and hold harmless the State of North Dakota, its agencies, officers and employees (State of ND), from and against claims based on the vicarious liability of State of ND or its agents, but not against claims based on the State of ND's contributory negligence, comparative and/or contributory negligence or fault, sole negligence, or intentional misconduct. This obligation to defend, indemnify, and hold harmless does not extend to professional liability claims arising from professional errors and omissions. The legal defense provided by Contractor to State of ND under this provision must be free of any conflicts of interest, even if retention of separate legal counsel for State of ND is necessary. Any attorney appointed to represent the State must first qualify as and be appointed by the North Dakota Attorney General as a Special Assistant Attorney General as required under N.D.C.C. 54-12-08. Contractor also agrees to defend, indemnify, and hold State harmless for all costs, expenses and attorneys' fees incurred if State of ND prevails in an action against Contractor in establishing and litigating the indemnification coverage provided herein. This obligation shall continue after the termination of this Contract.

13.0 CONFIDENTIALITY

Contractor shall not use or disclose any information it receives from State under this Contract that State has previously identified as confidential or exempt from mandatory public disclosure except as necessary to carry out the purposes of this Contract or as authorized in advance by State. State shall not disclose any information it receives from Contractor that Contractor has previously identified as confidential and that State determines in its sole discretion is protected from mandatory public disclosure under a specific exception to the North Dakota public records law, N.D.C.C. ch. 44-04. The duty of State and Contractor to maintain confidentiality of information under this section continues beyond the Term of this Contract.

14.0 COMPLIANCE WITH PUBLIC RECORDS LAWS

Under the North Dakota public records law and subject to the Confidentiality clause of this Contract, certain records may be open to the public upon request.

Public records may include: (a) records State receives from Contractor under this Contract, (b) records obtained by either Party under this Contract, and (c) records generated by either Party under this Contract.

Contractor agrees to contact State immediately upon receiving a request for information under the public records law and to comply with State's instructions on how to respond to such request.

15.0 INDEPENDENT ENTITY

Contractor is an independent entity under this Contract and is not a State employee for any purpose, including the application of the Social Security Act, the Fair Labor Standards Act, the Federal Insurance Contribution Act, the North Dakota Unemployment Compensation Law and the North Dakota Workforce Safety and Insurance Act. Contractor retains sole and absolute discretion in the manner and means of carrying out Contractor's activities and responsibilities under this Contract, except to the extent specified in this Contract.

16.0 SPOILIATION – PRESERVATION OF EVIDENCE

Contractor shall promptly notify State of all potential claims that arise or result from this Contract. Contractor shall also take all reasonable steps to preserve all physical evidence and information that may be relevant to the circumstances surrounding a potential claim, while maintaining public safety, and grants to State the opportunity to review and inspect such evidence, including the scene of an accident.

17.0 MERGER AND MODIFICATION, CONFLICT IN DOCUMENTS

This Contract, including the following documents, constitutes the entire agreement between the Parties. There are no understandings, agreements, or representations, oral or written, not specified within this Contract. This Contract may not be modified, supplemented or amended, in any manner, except by written agreement signed by both Parties.

18.0 SEVERABILITY

If any term of this Contract is declared to be illegal or unenforceable by a court having competent jurisdiction, the validity of the remaining terms is unaffected and, if possible, the rights and obligations of the Parties are to be construed and enforced as if this Contract did not contain that term.

19.0 APPLICABLE LAW AND VENUE

This Contract is governed by and construed in accordance with the laws of the State of North Dakota. Any action to enforce this Contract must be adjudicated exclusively in the state District Court of Burleigh County, North Dakota. Each Party consents to the exclusive jurisdiction of such court and waives any claim of lack of jurisdiction or *forum non conveniens*.

20.0 ALTERNATIVE DISPUTE RESOLUTION – JURY TRIAL

By entering this Contract, State does not agree to binding arbitration, mediation, or any other form of mandatory Alternative Dispute Resolution. The Parties may enforce the rights and remedies in judicial proceedings. State does not waive any right to a jury trial.

21.0 ATTORNEY FEES

In the event a lawsuit is instituted by State to obtain performance due under this Contract, and State is the prevailing Party, Contractor shall, except when prohibited by N.D.C.C. § 28 26 04, pay State's reasonable attorney fees and costs in connection with the lawsuit.

22.0 NONDISCRIMINATION AND COMPLIANCE WITH LAWS

Contractor agrees to comply with all applicable federal and state laws, rules, and policies, including those relating to nondiscrimination, accessibility, and civil rights. (See N.D.C.C. Title 34 – Labor and Employment, specifically N.D.C.C. ch. 34-06.1 Equal Pay for Men and Women.)

Contractor agrees to timely file all required reports, make required payroll deductions, and timely pay all taxes and premiums owed, including sales and use taxes, unemployment compensation and workers' compensation premiums.

Contractor shall have and keep current all licenses and permits required by law during the Term of this Contract.

Contractor is prohibited from boycotting Israel for the duration of this Contract. (See N.D.C.C § 54-44.4-15.) Contractor represents that it does not and will not engage in a boycotting Israel during the term of this Contract. If State receives evidence that Contractor boycotts Israel, State shall determine whether the company boycotts Israel. The foregoing does not apply to contracts with a total value of less than \$100,000 or if Contractor has fewer than ten (10) full-time employees.

Contractor's failure to comply with this section may be deemed a material breach by Contractor entitling State to terminate in accordance with the Termination for Cause section of this Contract.

23.0 STATE AUDIT

Pursuant to N.D.C.C. § 54-10-19, all records, regardless of physical form, and the accounting practices and procedures of Contractor relevant to this Contract are subject to examination by the North Dakota State Auditor, the Auditor's designee, or Federal auditors, if required. Contractor shall maintain these records for at least three (3) years following completion of this Contract and be able to provide them upon reasonable notice. State, State Auditor, or Auditor's designee shall provide reasonable notice to Contractor prior to conducting examination.

24.0 COUNTERPARTS

This Contract may be executed in multiple, identical counterparts, each of which is be deemed an original, and all of which taken together shall constitute one and the same contract.

25.0 EFFECTIVENESS OF CONTRACT

This Contract is not effective until fully executed by both Parties. If no start date is specified in the Term of Contract, the most recent date of the signatures of the Parties shall be deemed the Effective Date.

IN WITNESS WHEREOF, the parties have caused this Agreement to be entered into as of the date first above written.

NORTH DAKOTA INDUSTRIAL COMMISSION

By: _____

By: _____

Name

Date: _____

Date: _____

Industrial Commission
of North Dakota

Doug Burgum
GOVERNOR

Drew H. Wrigley
ATTORNEY GENERAL

Doug Goehring
AGRICULTURE COMMISSIONER



North Dakota Public Finance Authority

Memorandum

To: Public Finance Authority Advisory Committee
Miles Silbert, Public Financial Management, LLC
Kylee Merkel, Bank of North Dakota

From: DeAnn Ament, Executive Director

Date: May 13, 2024

Re: City of Minot
Drinking Water State Revolving Fund

Purpose of the Project: Replace cast iron pipe with PVC pipe which will reduce the breaks and the water quality issues.

Project Amount:

DWSRF Request	\$ 3,704,000
DWR Cost Share	5,556,251
Local	351,260
Total Project Cost	\$ 9,611,511

Population to Benefit from the Project: 1,000; \$9,612/person

Population Served by the System: 58,692

Is the Project Area Within the Extraterritorial Jurisdiction of a City: No

The requested term for the Drinking Water State Revolving Fund (DWSRF) loan is 20 years. The City of Minot will issue revenue bonds payable with water user fees. The net average annual payment for the revenue bonds will be \$216,439. The reserve requirement will be \$226,600 and the 110% coverage requirement will be \$238,083.

The City has 13,896 residential users that pay a monthly water base rate of \$10.78 with a \$3.75/1,000-gallon charge and 1,213 commercial users that pay a monthly water base rate of \$13.20 with a \$4.22/1,000-gallon charge.

Water Fund:

	Unaudited			
	2020	2021	2022	2023
Interest Revenue	\$275,737	-\$14,938	-\$107,043	\$1,530,065
Operating Revenue	22,192,914	22,909,469	22,841,647	24,243,313
Operating Expenses	30,443,476	33,159,587	35,609,828	38,346,174
Net Operating Loss	-7,974,825	-10,265,056	-12,875,224	-12,572,796
Depreciation	15,112,111	15,507,128	15,858,850	17,104,529
Transfers In - Sales Tax	3,889,526	1,137,307	1,840,213	871,566
Adjusted Net Operating Revenue	11,026,812	6,379,379	4,823,839	5,403,299
Revenue Bond Payments	3,392,257	3,475,856	3,795,235	3,783,310
Net Operating Coverage	325%	184%	127%	143%
Proforma DWSRF Bond Payment	\$216,439	\$216,439	\$216,439	\$216,439
Proforma Net Operating Coverage	306%	173%	120%	135%

The existing net operating revenue will be sufficient to meet the 110% net operating coverage.

The outstanding indebtedness as of December 31, 2023:

	Original Issue	Outstanding Balance
General Obligation	\$ 14,450,000	\$ 6,595,000
Refunding Improvement Bonds	\$16,785,000	\$11,310,000
Sales Tax Revenue Bonds *	1,945,000	\$925,000
Revenue Bonds - Water/Sewer *	\$93,922,946	\$73,607,660
Revenue Bonds - Airport	\$28,520,000	\$21,445,000
	<u>\$ 155,622,946</u>	<u>\$ 113,882,660</u>

*All payments have been made as agreed. The City has two Clean Water SRF and one DWSRF loans with a combined outstanding balance of \$14,372,660 as of December 31, 2023.

The City of Minot is located in Ward County 110 miles north of Bismarck on US Highway 83. Based on the 2020 census, the total population is 48,377; this is an increase of 7,489 from the 2010 census. The largest employers are Minot Air Force Base with 12,123 employees, Trinity Health which has 2,850 employees, and Minot Public Schools employs 1,047.

K-12 School Enrollment:

			Current	Estimated
2020-2021	2021-2022	2022-2023	2023-2024	2024-2025
7,662	7,733	7,700	7,658	7,700

The City's 2023 taxable valuation was \$231,551,500. This is an increase of \$23,944,274 over the 2019 taxable valuation.

Property Tax Collections 4/30/2024:

Levy Year	Dollar Amount of Levy	Amount Collected to Date of Application	Percentage Collected
2023	27,730,619	25,860,677	93%
2022	26,648,754	26,211,245	98%
2021	25,634,913	25,529,896	100%

Special Assessment Collections 4/30/2024:

Year	Dollar Amount	Amount Collected to Date of Application	Percentage Collected
2023	1,633,326	1,471,185	90%
2022	1,485,444	1,379,930	93%
2021	1,622,881	1,578,235	97%

Mill Levy History:

Year	City	School	Park District	State and County	Total for Each Year
2023	119.76	139.69	48.30	57.65	365.40
2022	119.15	142.34	48.57	56.95	367.01
2021	121.47	109.34	45.58	58.91	335.30
2020	119.95	109.33	42.66	60.38	332.32
2019	121.87	111.34	43.22	61.27	337.70

Memorandum

To: Industrial Commission

From: Kylee Merkel, Business Banker
Bank of North Dakota

Date: May 14, 2024

RE: City of Minot
Drinking Water State Revolving Fund Program

ND Public Finance Authority has delivered to BND their memo which recommends approval of a \$3,704,000 loan to the City of Minot under the Drinking Water State Revolving Fund (DWSRF). The entire cost of the project is \$9,611,511, with Department of Water Resources providing a \$5,556,251 cost-share grant and the City contributing funds of \$351,260.

The project will replace the cast iron pipe with PVC pipe. The requested loan term is 20 years. The City will issue a revenue bond payable with water user fees. The annual payment will average \$216,439.

Debt Service Coverage:

Water, Sewer & Storm Sewer Fund	2020	2021	2022	Projected
Operating Revenue	22,192,914	22,909,469	22,841,647	22,841,647
Interest Revenue	275,737	-14,938	-107,043	-107,043
Operating Expenses	-30,443,476	-33,159,587	-35,609,828	-35,609,828
Net Operating Revenue	-7,974,825	-10,265,056	-12,875,224	-12,875,224
Plus: Sales Tax Transfers In	3,889,526	1,137,307	1,840,213	1,840,213
Plus: Depreciation/Transfers In	15,112,111	15,507,128	15,858,850	15,858,850
Adjusted Net Operating Income	11,026,812	6,379,379	4,823,839	4,823,839
Current Debt Service	3,392,257	3,475,856	3,795,235	3,795,235
Proposed Debt Service				216,439
Total Debt Service				4,011,674
Debt Service Coverage	325%	184%	127%	120%

The City currently serves 13,896 residential connections that pay a monthly base rate of \$10.78 and a usage charge of \$3.75 per 1,000 gallons. The City also serves 1,213 commercial connections that pay a monthly base rate of \$13.20 and a usage charge of \$4.22 per 1,000 gallons. The existing revenues will generate sufficient net operating revenues to service both the new and existing debt.

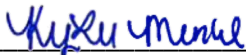
Outstanding Debt (as of December 31, 2023):

	Original Amount	Current Balance
General Obligation Bonds	14,450,000	6,595,000
Improvement Bonds	16,785,000	11,310,000
Sales Tax Revenue Bonds	1,945,000	925,000
Water/Sewer Revenue Bonds	93,922,946	73,607,660
Airport Revenue Bonds	28,520,000	21,445,000
	155,622,946	113,882,660

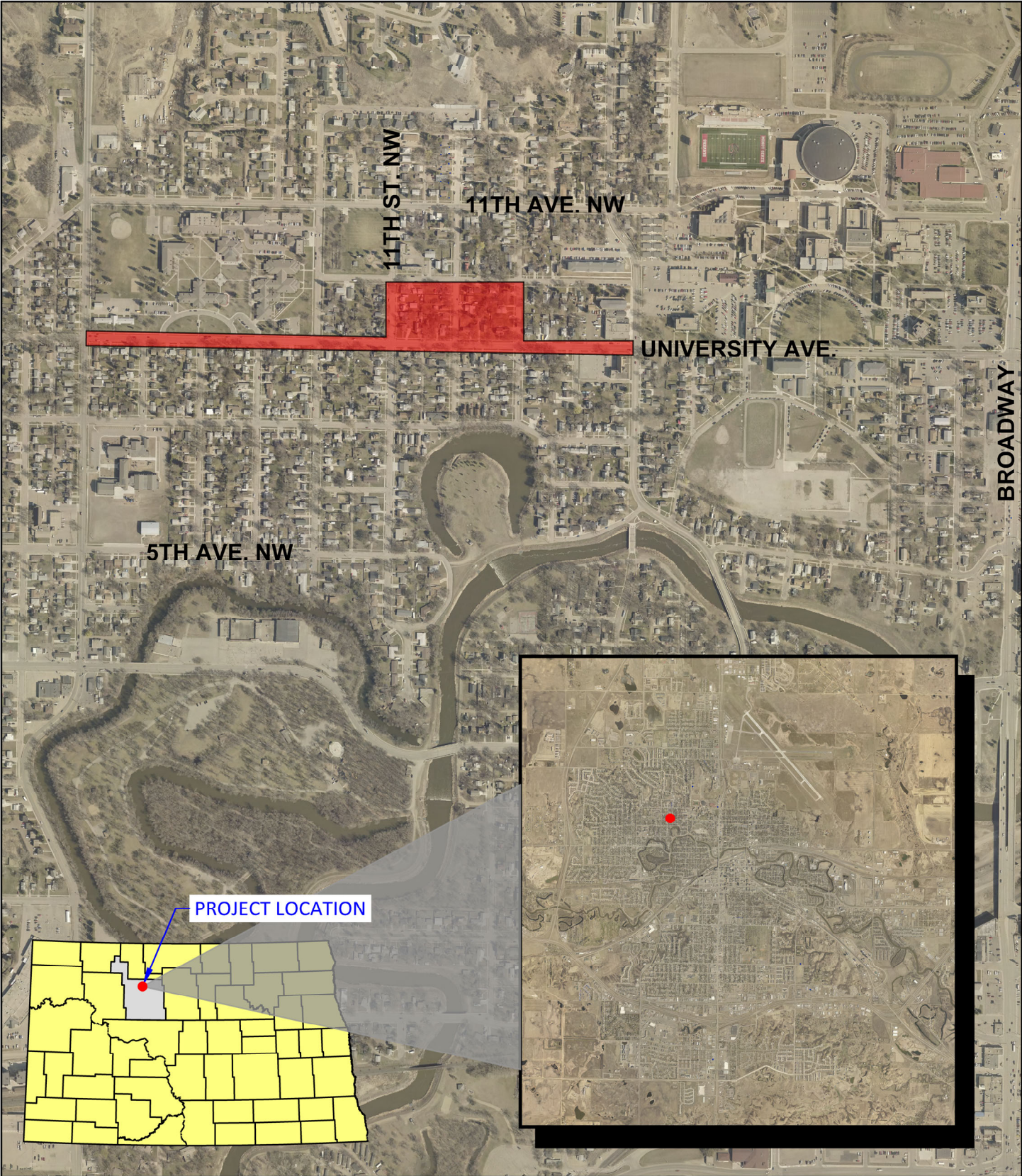
Average annual debt service requirements are estimated at \$11,816,576, which is an average of \$244.26 per resident.

Historical census populations for the City of Minot were 48,377 in 2020, 40,888 in 2010 and 36,567 in 2000. The largest employers in the City are Minot Air Force Base, Trinity Health and Minot Public School.

Based upon the PFA recommendation and the benefits obtained with this project, BND concurs with their evaluation and support of the request.



Kylee Merkel
Business Banker



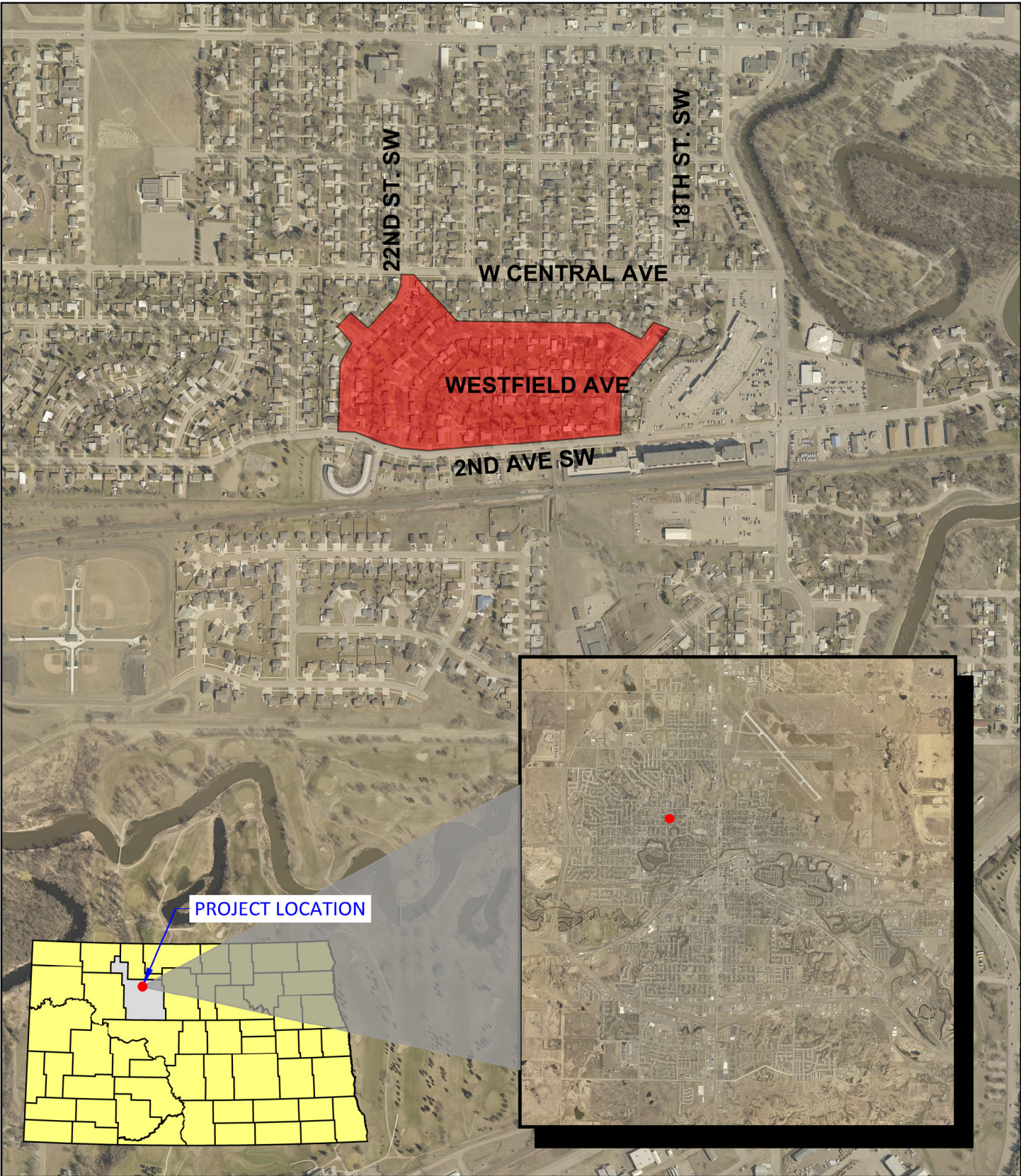
PROJECT LOCATION



**COST-SHARE APPLICATION
NW MINOT RESIDENTIAL WATERMAIN
REPLACEMENT - PHASE 2**

DATE DRAWN: 10/02/2023





22ND ST. SW

18TH ST. SW

W CENTRAL AVE

WESTFIELD AVE

2ND AVE SW

PROJECT LOCATION



COST-SHARE APPLICATION
WESTFIELD ADDITION MINOT RESIDENTIAL
WATERMAIN REPLACEMENT

DATE DRAWN: 10/02/2023



Industrial Commission
of North Dakota

Doug Burgum
GOVERNOR

Drew H. Wrigley
ATTORNEY GENERAL

Doug Goehring
AGRICULTURE COMMISSIONER



**North Dakota Public
Finance Authority**

Memorandum

To: Industrial Commission: Governor Doug Burgum, Attorney General Drew H. Wrigley,
Agriculture Commissioner Doug Goehring

From: DeAnn Ament, Executive Director

Date: May 21, 2024

Re: Drake, Clean Water State Revolving Fund
Medina, Drinking Water State Revolving Fund
Northeast Regional Water District, Drinking Water State Revolving Fund

Under current policy, the Public Finance Authority can make loans under the State Revolving Fund Program in an amount not to exceed \$2,000,000 and under the Capital Financing Program in an amount not to exceed \$500,000 without seeking the final approval of the Industrial Commission. Within this policy, once the loan has been approved, the Public Finance Authority is required to provide the details of the loan to the Industrial Commission. Accordingly, the Public Finance Authority and its Advisory Committee used this policy to approve the following loans.

The committee reviewed the City of Drake's Clean Water State Revolving Fund \$149,000 application towards a \$483,845 project. CDBG is providing a \$190,845 grant and locally \$144,000 is being provided. The project will replace the lift station, install a new barrel section, grinder, larger pumps and upsize the forcemain to adequately meet the meet the flows and reduce the number of backups. The requested term for the loan is 20 years. The city will issue revenue bonds payable from sewer revenues.

The committee reviewed the City of Medinas's Drinking Water State Revolving Fund (DWSRF) \$1,250,000 loan which is eligible for \$938,000 loan forgiveness, so the net loan will be \$312,000. The requested loan term is 30 years. The City will issue improvement bonds payable with special assessments. The improvement bonds will be a contingent general obligation of the City, backed by the statutory requirement that the City will levy a general deficiency tax in the event that the revenues from the collection of special assessments are not sufficient to pay the debt service on the improvement bonds.

The committee reviewed Northeast Regional Water District's DWSRF application for a \$1,768,000 loan. This project updates the water treatment plant including new control panels,

automating the backwash system and chemical feed as well as raw water reservoir/pumping facility improvements. Also, new control panels with breakers will be installed in the wellfield. The requested loan term is 30 years. The District will issue revenue bonds payable with water user fees.

The Public Finance Authority's Advisory Committee approved these loans at their May 21, 2024, meeting.

Industrial Commission
of North Dakota

Doug Burgum
GOVERNOR

Drew H. Wrigley
ATTORNEY GENERAL

Doug Goehring
AGRICULTURE COMMISSIONER



**North Dakota Public
Finance Authority**

Memorandum

To: Public Finance Authority Advisory Committee

From: DeAnn Ament, Executive Director

Date: May 20, 2024

Re: City of Drake
Clean Water State Revolving Fund

Purpose of the Project: Replace the lift station, install a new barrel section, grinder, larger pumps and upsize the forcemain to adequately meet the meet the flows and reduce the number of backups.

Project Amount:

CWSRF Request	\$ 149,000
CDBG Grant	190,845
Local Funds	144,000
Project Total	\$ 483,845

Population to Benefit from the Project: 292; \$1,657/person

Population Served by the System: 292

Is the Project Area Within the Extraterritorial Jurisdiction of a City: No

The requested term for the Clean Water State Revolving Fund (CWSRF) loan is 20 years. The City of Drake will issue revenue bonds payable from sewer revenues. The average annual payment for the revenue bonds will be \$8,755. The 110% coverage requirement will be \$9,630 and the required debt service reserve will be \$10,150.

The City has 182 sanitary sewer connections which pay a base rate of \$17 per connection per month.

Sewer Fund:

	Unaudited			
	2020	2021	2022	2023
Operating Revenue	\$23,953	\$23,028	\$23,917	\$26,399
Operating Expenses	14,495	8,164	5,363	4,781
Net Operating Revenue	<u>\$9,458</u>	<u>\$14,864</u>	<u>\$18,554</u>	<u>\$21,619</u>

The existing excess sewer revenues will be sufficient to meet the 110% net operating coverage.

The City’s outstanding indebtedness as of December 31, 2023:

	Original Amount	Amount Outstanding
Improvement Bonds	\$ 773,400	\$ 255,560
	<u>\$ 773,400</u>	<u>\$ 255,560</u>

The estimated annual debt service requirements are \$47,462, which is an average of \$163 per resident.

The City of Drake is located in McHenry County 50 miles southeast of Minot on US Highway 52. Based on the 2020 census, the total population is 292; this is an increase of 17 from the 2010 census. The largest employers in the City are Drake Public Schools employs 16, Enberbase of Drake (gas station) with 10 employees, and Drake Fresh Foods (grocery store) has 5 employees.

Drake School District Grades 7-12 Enrollment:

				Projected
2020-2021	2021-2022	2022-2023	2023-2024	2024-2025
70	73	71	73	73

The City's 2023 taxable valuation was \$575,818. This is an increase of \$58,638 over the 2019 taxable valuation.

Property Tax Collections 4/30/2024:

Levy Year	Dollar Amount of Levy	Amount Collected to Date of Application	Percentage Collected
2023	\$42,725	\$14,924	35%
2022	\$49,063	\$44,416	91%
2021	\$49,859	\$46,747	94%

Special Assessment Collections 4/30/2024:

Year	Dollar Amount	Amount Collected to Date of Application	Percentage Collected
2023	\$35,263	\$15,319	43%
2022	\$36,554	\$30,553	84%
2021	\$37,626	\$34,095	91%

Mill Levy History:

Year	City	School	Park District	State and County	Other	Total for Each Year
2023	75.49	62.10	7.95	63.96	10.30	219.80
2022	87.94	57.73	7.99	60.10	12.34	226.10
2021	89.82	53.94	7.02	59.22	11.59	221.59
2020	85.98	52.05	7.20	59.62	12.67	217.52
2019	83.40	48.74	7.99	59.74	12.91	212.78



PROPOSED 2023 LIFT STATION IMPROVEMENTS DRAKE, NORTH DAKOTA



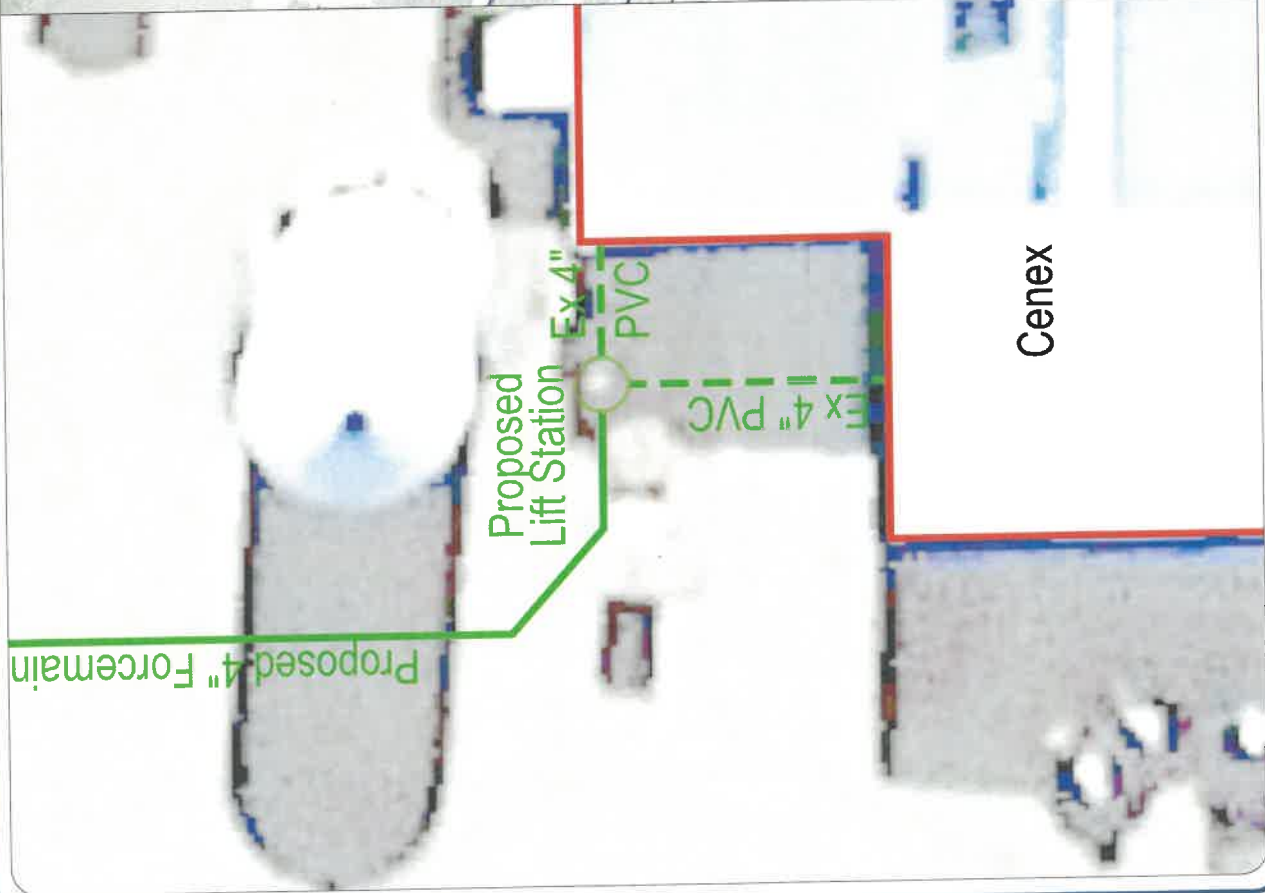
Attachment 7C

Existing City
Master Lift Station

1st Avenue

Proposed 4" Forcemain

Cenex



Industrial Commission
of North Dakota

Doug Burgum
GOVERNOR

Drew H. Wrigley
ATTORNEY GENERAL

Doug Goehring
AGRICULTURE COMMISSIONER



North Dakota Public Finance Authority

Memorandum

To: Public Finance Authority Advisory Committee
Miles Silbert, Public Financial Management
Kylee Merkel, Bank of North Dakota

From: DeAnn Ament, Executive Director

Date: May 15, 2024

Re: City of Medina
Drinking Water State Revolving Fund Program Loan

Purpose of the Project: Replace the equipment and controls at the water treatment plant and make well field improvements.

Project Amount:

DWSRF Request	\$1,250,000
DWSRF Loan Forgiveness	(938,000)
Net DWSRF Loan	\$ 312,000

Population to Benefit from the Project: 264; \$4,735/person

Population Served by the System: 264

Is the Project Area Within the Extraterritorial Jurisdiction of a City: No

The City will issue improvement bonds payable with special assessments. The requested term is 30 years. The net average annual payment for the improvement bonds will be \$13,008. The improvement bonds will be a contingent general obligation of the City, backed by the statutory requirement that the City will levy a general deficiency tax in the event that the revenues from the collection of special assessments are not sufficient to pay the debt service on the improvement bonds.

The City has 167 residential connections which pay a base rate of \$30 and 27 commercial connections which pay a base rate of \$33 per connection. The base rate provides 2,000 gallons and above that threshold, all connections pay \$5/1,000 gallons.

Water Fund:

	2020	2021	2022	2023
Operating Revenue	\$93,321	\$98,283	\$86,172	\$88,946
Operating Expenses	68,083	83,436	108,108 ¹	113,857 ¹
Net Operating Revenue (Expenses)	<u>\$25,239</u>	<u>\$14,848</u>	<u>-\$21,936</u>	<u>-\$24,912</u>

¹ Expense are increased due to paying a contracted plant operator until the new employee is certified.

Outstanding Debt December 31, 2023:

	Original Amount	Outstanding Amount
Water Improvement Bonds	\$1,636,000	\$785,990
Total	<u>\$1,636,000</u>	<u>\$785,990</u>

Two of the three improvement bonds will be paid off in 2024 leaving an outstanding balance of \$1,835,652 with the new improvement bond and an estimated population of 264 the improvement bond debt is \$6,953 per person. With 300 parcels to be assessed, the net average annual assessment per parcel will be approximately \$43. The average annual payment of all bonded debt will be \$92,696.

The City of Medina is located in Stutsman County 30 miles west of Jamestown just off on Interstate 94. Based on the 2020 census, the total population was 264; this is a decrease of 44 from the 2010 census. The largest employers in the City are Medina Public Schools with 42 employees, Guthmiller’s Earthmoving (construction) with 30 employees and Farmer’s Union Oil (shop/convenience store) which employs 10.

School Enrollment:

2020-2021	2021-2022	2022-2023	2023-2024	Projected 2024-2025
165	189	197	202	210

The City's 2023 taxable valuation was \$673,796. This is an increase of \$279,720 from the 2019 taxable valuation.

Property Taxes Levied & Collected 1/31/2024:

Levy Year	Dollar Amount of Levy	Amount Collected to Date of Application	Percentage Collected
2023	\$70,923	\$23,652	33%
2022	\$69,502	\$64,032	92%
2021	\$43,507	\$41,044	94%

Special Assessments Levied & Collected 1/31/2024:

Year	Dollar Amount	Amount Collected to Date of Application	Percentage Collected
2023	\$91,790	\$27,598	30%
2022	\$83,278	\$70,862	85%
2021	\$87,938	\$77,491	88%

City of Medina Mill Levy History:

Year	City	School	Park District	State and County	Other	Total for Each Year
12023	105.26	90.00	6.70	78.89	17.42	298.27
2022	105.28	90.00	7.05	74.81	17.42	294.56
2021	105.46	90.00	11.08	73.94	17.42	297.90
2020	105.46	90.00	10.83	71.02	7.42	284.73
2019	105.50	90.00	11.99	74.51	7.42	289.42

Memorandum

To: Industrial Commission

From: Kylee Merkel, Business Banker
Bank of North Dakota

Date: May 16, 2024

RE: City of Medina
Drinking Water State Revolving Fund Program

ND Public Finance Authority has delivered to BND their memo which recommends approval of a \$1,250,000 loan to the City of Medina under the Drinking Water State Revolving Fund (DWSRF). DWSRF is financing the full cost of the project. This project is eligible for \$938,000 of DWSRF loan forgiveness, making the net loan \$312,000.

The project will replace the equipment and controls at the water treatment plant and make well field improvements. The requested loan term is 30 years. The City will issue an improvement bond payable with special assessment collections. The annual payment will average \$13,008. The improvement district includes 300 parcels.

Summary of Water Fund:

Water Fund	2021	2022	2023
Operating Revenue	98,283	86,172	88,946
Operating Expenses	-83,436	-108,108	-113,857
Net Operating Revenue	14,848	-21,936	-24,912

Operating expenses for 2022 and 2023 are higher due to the City paying a contracted water plant operator until the new employee is certified. The City currently serves 167 residential connections which pay a monthly base rate of \$33 and a volume charge of \$5 per 1,000 gallons in excess of 2,000 gallons.

Outstanding Debt (as of December 31, 2023):

	Original Amount	Current Balance
Water Improvement Bonds	1,636,000	785,990
	1,636,000	785,990

Average annual debt service requirements are estimated at \$92,696, which is an average of \$351.12 per resident.

Historical census populations for the City of Medina were 264 in 2020, 308 in 2010 and 334 in 2000. The largest employers in the City are Medina Public School, Guthmiller's Earthmoving and Farmer's Union Oil.

Based upon the PFA recommendation and the benefits obtained with this project, BND concurs with their evaluation and support of the request.



Kylee Merkel
Business Banker

50 South Sixth Street
Suite 2250
Minneapolis, MN 55402

612.338.3535
612.338.7264 Fax
www.pfm.com



Memorandum

TO: DeAnn Ament, Executive Director
North Dakota Public Finance Authority

FROM: PFM Financial Advisors LLC

DATE: May 20, 2024

RE: Marketplace Analysis - Drinking Water State Revolving Fund Program
City of Medina

The City of Medina (“City”) has presented a request to the Authority and the North Dakota Department of Environmental Quality (“Department”) for a \$1,250,000 loan of which \$938,000 will be loan forgiveness, for a total of \$312,000 under the Drinking Water State Revolving Fund Program (“DWSRF Program”). The DWSRF Program is used to make subsidized interest rate loans to political subdivisions for the purpose of constructing various water treatment, distribution, and storage facilities as approved by the Department in accordance with federal and state regulations and an updated Intended Use Plan prepared by the Department.

The City intends to use the proceeds to upgrade the water treatment plan by replacing the equipment and controls and also make well field improvements.

The municipal securities to be acquired by the Authority will be improvement bonds of the City payable from special assessments levied against the benefited property. The City’s average annual payment under the proposed loan will be approximately \$13,008. The improvement bonds will be a contingent general obligation of the City, which will be required by law to levy a general deficiency tax if the revenues collected from the levy of special assessments are insufficient to make the debt service payments.

As of December 31, 2023, the City has \$785,990 of Water Improvement Bonds outstanding.

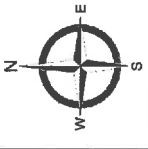
Funding for the construction of the City’s projects has been included in a list of approved projects as prepared and updated by the Department. As an authorized participant in the DWSRF Program, the City will benefit substantially from the subsidized fixed rate loans made under the Program. Consequently, no other financing mechanism can provide a greater cost advantage than that offered by the DWSRF Program.



Legend

Project Area

**PROJECT AREA
MEDINA, NORTH DAKOTA**



Created By: BAS Date Created: 06/19/2023 Date Saved: 08/19/23 Date Plotted: N/A
 Plotted By: brook.smith Parcel Date: 03/19/2022 Aerial Image: 2022 County NMP SIDS
 Project: 231002314010_ACP-Prj-23140 Project Area: 23140 Project Area.aprx
 Date Exported: 08/19/23

Industrial Commission
of North Dakota

Doug Burgum
GOVERNOR

ew H. Wrigley
TORNEY GENERAL

Doug Goehring
AGRICULTURE COMMISSIONER



North Dakota Public Finance Authority

Memorandum

To: Public Finance Authority Advisory Committee
Miles Silbert, Public Financial Management
Kylee Merkel, Bank of North Dakota

From: DeAnn Ament, Executive Director

Date: May 16, 2024

Re: Northeast Regional Water District, Drinking Water State Revolving Fund

Purpose of the Project: Water treatment plant updates including new control panels, automating the backwash system and chemical feed as well as raw water reservoir/pumping facility improvements. Also, new control panels with breakers will be installed in the wellfield.

Project Amount:

DWSRF Request	\$ 1,768,000
DWR Cost Share	5,304,225
EPA SDC Emerging Contaminants Grant	10,608,450
Project Total	\$ 17,680,675

Users to Benefit from the Project: 14,565; \$1,214 per user

Users Served by the System: 14,565 which includes 22 bulk users including 12 cities that serve a total population of 6,257

The requested term for the Drinking Water State Revolving Fund (DWSRF) loan is 30 years. The District will issue revenue bonds payable with water user fees. The average annual payment for the revenue bonds will be \$74,916. The reserve requirement will be \$81,200 and the 110% coverage requirement will be \$82,407.

The District encompasses Cavalier and Pembina Counties along with portions of Towner, Ramsey, and Walsh Counties and provides water services to 2,684 residential connections and 22 bulk users. North Valley Water District users pay a monthly base rate of \$50. Langdon Rural Water District users' monthly base rate is \$63. All residential connections pay \$7.50/1,000 gallons.

Net Operating Coverage:

	2020	2021	2022	2023
Interest Revenue	\$16,309	\$14,569	\$4,944	\$20,150
Operating Revenue	3,593,497	4,233,073	4,166,409	4,294,504
Operating Expenses	3,959,305	4,077,259	4,240,573	4,500,639
Net Operating Revenue (Expenses)	(349,499)	170,383	(69,220)	(185,985)
Depreciation	1,861,077	1,887,519	1,895,402	2,200,165
Adjusted Net Operating Revenue	\$1,511,578	\$2,057,902	\$1,826,182	\$2,014,180
Revenue Bond Payments	\$1,149,653	\$1,239,086	\$1,258,421	\$1,751,732
Net Operating Coverage	131%	166%	145%	115%
Proforma DW Payment	\$74,916	\$74,916	\$74,916	\$74,916
Proforma Net Operating Coverage	123%	157%	137%	110%

The net operating revenue will be sufficient to meet the 110% net operating coverage requirement.

The total outstanding debt of the District as of December 31, 2023:

	Original Debt	Outstanding Debt
Total Revenue Bond Debt*	\$18,106,920	\$14,101,083

* All payments have been made as agreed. The District has three DWSRF loans outstanding totaling \$7,115,000. The District has a debt service reserve fund balance of \$1,207,870.

The current estimated population of the District is 14,565. Major employers in the service area are Motor Coach Industries with 120 employees, Cavalier County Memorial Hospital and Clinics has 100 employees and Langdon Area School District employs 80.

District-Wide School Enrollment for K-12:

2020-2021	2021-2022	2022-2023	2023-2024	Projected 2024-2025
2,738	2,646	2,694	2,655	2,630

Memorandum

To: Industrial Commission

From: Kylee Merkel, Business Banker
Bank of North Dakota

Date: May 16, 2024

RE: Northeast Regional Water Users District
Drinking Water State Revolving Fund Program

ND Public Finance Authority has delivered to BND their memo which recommends approval of a \$1,768,000 loan to Northeast Regional Water Users District under the Drinking Water State Revolving Fund (DWSRF). The total cost of the project is \$17,680,675, with \$5,304,225 coming from a Department of Water Resources cost-share grant and \$10,608,450 coming from an EPA SDC Emerging Contaminants Grant.

The project includes water treatment plant updates, raw water reservoir/pumping facility improvements and new control panels installed in the wellfield. The requested loan term is 30 years. The District will issue revenue bonds payable from user fees. The annual payment will average \$74,916.

Debt Service Coverage:

	2021	2022	2023	Projected
Operating Revenue	4,233,073	4,166,409	4,294,504	4,294,504
Interest Revenue	14,569	4,944	20,150	20,150
Operating Expenses	-4,077,259	-4,240,573	-4,500,639	-4,500,639
Net Operating Revenue	170,383	-69,220	-185,985	-185,985
Add: Depreciation	1,887,519	1,895,402	2,200,165	2,200,165
Adjusted Operating Income	2,057,902	1,826,182	2,014,180	2,014,180
Current Debt Service	1,239,086	1,258,421	1,751,732	1,751,732
Proposed Debt Service				74,916
Current Debt Service	1,239,086	1,258,421	1,751,732	1,826,648
Debt Service Coverage	166.08%	145.12%	114.98%	110.27%

Residential connections in the North Valley Water District pay a monthly base rate of \$50. Residential connections in the Langdon Rural Water District pay a monthly base rate of \$63. All residential connections pay a usage fee of \$7.50 per 1,000 gallons. The Regional system currently has 2,684 residential connections and 22 bulk users. The existing user fees, will generate sufficient net operating revenues to service both the new and existing debt.

Outstanding Debt:

	<u>Original Amount</u>	<u>Amount Outstanding</u>
Revenue Bonds	\$18,106,920	\$14,101,083
Total Revenue Bonds	<u>\$18,106,920</u>	<u>\$14,101,083</u>

Average annual debt service requirements are estimated at \$1,266,043, which is an average of \$86.92 per resident of the District.

The regional system has 2,684 residential connections, 22 bulk connections and serves 12 cities. The District provides water services to Cavalier and Pembina counties as well as portions of Towner, Ramsey and Walsh counties. The District's estimated population is 14,565.

Based upon the PFA recommendation and the benefits obtained with this project, BND concurs with their evaluation and support of the request.

Kylee Merkel
Business Banker





50 South Sixth Street
Suite 2250
Minneapolis, MN 55402

612.338.3535
612.338.7264 Fax
www.pfm.com

Memorandum

TO: DeAnn Ament, Executive Director
North Dakota Public Finance Authority

FROM: PFM Financial Advisors LLC

DATE: May 20, 2024

RE: Marketplace Analysis - Drinking Water State Revolving Fund Program
North East Regional Water District

The Northeast Regional Water District (“District”) has presented a request to the Authority and the North Dakota Department of Environmental Quality (“Department”) for a \$1,768,000 loan under the Drinking Water State Revolving Fund Program (“DWSRF Program”). The DWSRF Program is used to make subsidized interest rate loans to political subdivisions for the purpose of constructing various water treatment, distribution, and storage facilities as approved by the Department in accordance with federal and state regulations and an updated Intended Use Plan prepared by the Department.

The District intends to use the proceeds for a myriad of updates to the water treatment plant which include new control panels, automating the backwash system and chemical feed, improvements to the raw water reservoir/pumping facility, and the installation of new control panels and breakers in the wellfield.

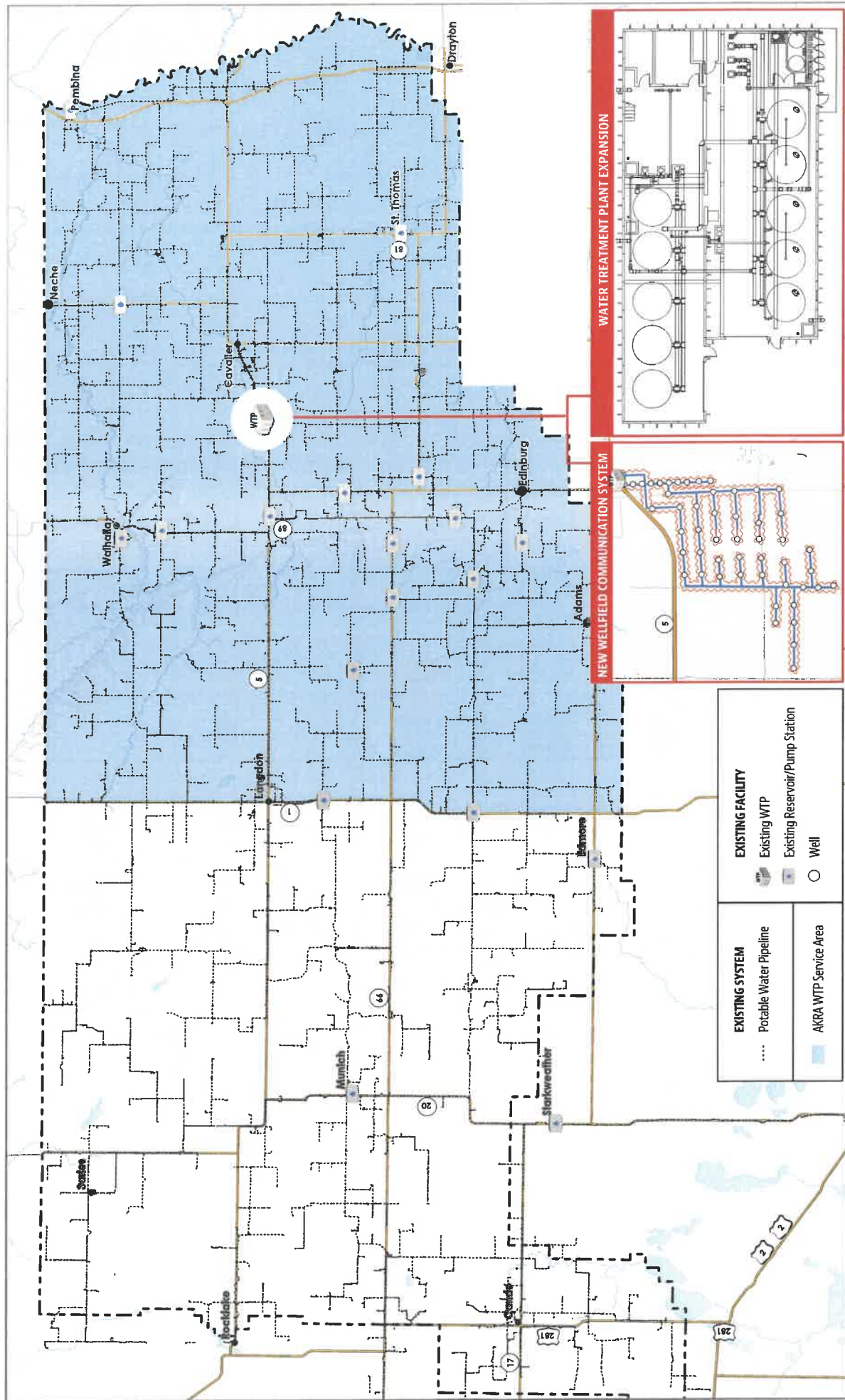
The municipal securities to be acquired by the Authority will be revenue bonds payable from water user fees. The District’s average annual payment under the proposed net loan amount will be approximately \$74,916 indicating a 110% net revenue coverage requirement of approximately \$82,407. The District will be required to deposit \$81,200 into a reserve fund with payments of \$16,240 per year over the first five years of the loan. Proforma net operating coverage of the water fund was 1.23x, 1.57x, 1.37x and 1.10x for 2020-2023, respectively. The existing net operating revenues of the water fund in addition to the new connections will provide sufficient net revenues to meet the 110% coverage requirement.

As of December 31, 2023, the District has \$14,101,083 of Revenue debt outstanding. The District has three Drinking Water SRF loans outstanding with a total balance of \$7,115,000. The District is current in its payments for its outstanding Authority loans.

Funding for the construction of the District's projects has been included in a list of approved projects as prepared and updated by the Department. As an authorized participant in the DWSRF Program, the District will benefit substantially from the subsidized fixed rate loans made under the Program. Consequently, no other financing mechanism can provide a greater cost advantage than that offered by the DWSRF Program.

NORTHEAST REGIONAL WATER DISTRICT

Attachment 7K



TO: Industrial Commission

FR: David A Flohr, Executive Director

RE: **FirstHome (Standard/Start/HomeAccess) and DCA Income Limits**

FirstHome and DCA Income Limit Proposal

The Department of Housing and Urban Development (HUD) published new median income numbers on April 3, 2024. These numbers are used to establish the Annual Income limits for the FirstHome, FirstHome Start, FirstHome DCA, and HomeAccess programs.

The new statewide median income for North Dakota increased \$3,500 (3.49%) to \$103,900 for 2024. This compares to the national median income increase of \$1,600 (1.66%) to \$97,800.

Mortgage Revenue Bond (MRB) regulations allow the use of the greater of county or state median income and those regulations and NDHFA policy limit household incomes as follows:

- FirstHome - 100% of median income - one and two member households by county (MRB regulation)
- FirstHome - 115% of median income - three or more member households by county (MRB regulation)
- DCA limits - 80% of median income by family size and county (NDHFA policy)

The proposed 2023 limits range from \$103,900 to \$128,110 depending on family size and county.

The NDHFA Advisory Board **recommends the Industrial Commission approve, in the form of Program Directive No. 122 per Exhibit 1, new Annual Income limits effective for loan reservations under the FirstHome (Standard/Start/HomeAccess) programs dated on or after June 1, 2024.**

The Advisory Board further recommends changes to the DCA Program limits per Exhibit 2 effective for loan reservations dated on or after June 1, 2024.

**NORTH DAKOTA HOUSING FINANCE AGENCY
HOME MORTGAGE FINANCE PROGRAM (FirstHome)**

PROGRAM DIRECTIVE NO. 122

MAXIMUM ANNUAL INCOME

The following Program Directive will serve as written notice of the applicable Maximum Annual Income (as defined in the 1994 Mortgage Purchase Agreement dated as of August 3, 1994) for an Eligible Mortgagor of a Mortgage Loan. These Maximum Annual Income limits are **effective for Mortgage Loans in which the Reservation is dated on or after the herein effective date June 1, 2024.**

Maximum Annual Income

FirstHome/Start/HomeAccess

County	Family Size	Family Size
	Less than 3	3 or more
Mercer/Williams	\$111,400	\$128,110
Burleigh/Morton/Oliver/McKenzie/Stark	\$108,300	\$124,545
Cass	\$105,900	\$121,785
Ward	\$105,200	\$120,980
Grand Forks	\$104,300	\$119,945
All Other Counties	\$103,900	\$119,485

Effective date of this Program Directive No. 122: **June 1, 2024**

NORTH DAKOTA HOUSING FINANCE AGENCY

DCA PROGRAM

MAXIMUM ANNUAL INCOME

These Maximum Annual Income limits are **effective for DCA assisted FirstHome Loans in which the Reservation is dated on or after the herein effective date of June 1, 2024.**

DCA INCOME LIMITS

06/01/2024

FAMILY SIZE*

COUNTY	1	2	3	4	5	6	7	8
Mercer/Williams	62,400	71,300	80,200	89,100	96,250	103,400	110,500	117,650
Burleigh/Morton/Oliver/McKenzie/Stark	60,700	69,350	78,000	86,650	93,600	100,550	107,450	114,400
Cass	59,300	67,800	76,250	84,700	91,500	98,300	105,050	111,850
Grand Forks/Ward	58,450	66,800	75,150	83,450	90,150	96,850	103,500	110,200
All Others	56,850	65,000	73,100	81,200	87,700	94,200	100,700	107,200

****Larger families, check with NDHFA for limits.***

HOME MORTGAGE FINANCE PROGRAM BONDS

NDHFA Bond Sale 2024AB

	Priced February 21, 2024		Priced July 11, 2023	
	Tax Exempt	Taxable	Tax Exempt	Taxable
	2024A	2024B	2023D	2023E
Bonds Issued	149,000,000	40,000,000	125,000,000	75,000,000
Bond Premium	2,393,524	218,198	3,291,197	819,408
Debt Service Reserve	(4,470,000)	(1,200,000)	(3,750,000)	(2,250,000)
Total Proceeds	146,923,524	39,018,198	124,541,197	73,569,408
Bond Yield	4.37%	5.72%	4.260%	5.490%
Cost of Issuance & Underwriters Discount (Agency)	1,344,526	371,982	1,108,143	667,780
Average Loan Amount	227,291	273,097	204,184	288,829
Estimated Number of Loans	646	143	610	255

Interest Rates Offered (30 Year Fixed rates adjusted daily):				
Government (1.5 Points*)	4.750%	7.200%	5.500%	6.250%
Conventional (1.5 Points*)	5.000%	7.450%	5.750%	6.500%
(*1% Orig. Fee & 1/2 Point)				

Eligible Loans include: FHA Insured, Conventional Insured, USDA RD RHS Guaranteed, VA Guaranteed, Uninsured

Home Sales Price Limits: (One Unit)
 All Counties 481,176
Higher Limits applicable to 2 - 4 Unit Residences

Borrower Income Limits: 100,400 to 126,040
 (Limits vary by county and household size)

Loan Type Limits:	Conventional	726,200
	FHA	472,030
	VA	726,200

Underwriters Discount Components:	\$/M Bonds
Management Expense	0.75
Take-Down	0.48
TOTAL	7.40
	8.63

Miscellaneous :
 Annual (Basis Points on Loans Outstanding) 20

Commentary: Since the beginning of 2023 the Federal Reserve has raised interest rates 4 times bringing the fed funds rate to 5.25% - 5.50%. During this same time the Agency has moved the tax exempt 30 year mortgage rate 9 times and continues to be well below the current market rate for a 30 year conventional loan. The average 30 year FHA mortgage rate is 6.61% and the average 30 year conventional mortgage right now is 7.11%. For the past two months the Agency is averaging just over \$10.4million a week in First Home (tax exempt) reservations and approximately \$1.4million in Roots (taxable) reservations. Currently, the average total payment (principal, interest, taxes and insurance) for a First Home borrower is \$1,191 and for a Roots borrower it is \$1,932.

**HOME MORTGAGE FINANCE PROGRAM BONDS
NDHFA Bond Sale 2024AB**

Tax Exempt		
Account	Total	Money Type
Parametric Portfolio Associates, Inc.	26,245	
Vanguard	25,550	Bond Fund
Spring Lake Asset Management	25,550	SMA
Capital Research	25,550	Bond Fund
Brown Brothers	25,550	Money Manager
Deutsche Asset Management	25,550	Bond Fund
Individuals	23,420	Individuals
NUVEEN ADVISORY CORP	22,670	Bond Fund
BOTO Holdings	14,000	
Millenium Fixed Income	12,500	
Foundation Credit Opportunities	12,500	
OLD ORCHARD CAPITAL MANAGEMENT LP	10,000	
Income Research & Management Inc.	7,985	Money Manager
16th Amendment Advisors LLC	7,000	Prop/Trading
Edward D. Jones & Co.	6,000	Broker/Dealer
Searle & Company	5,100	Broker/Dealer
Clark Capital Management Group Inc	5,020	SMA
Mariner Investment Group, Inc.	5,000	Hedge Fund
Northern Trust	4,535	Bond Fund
First New York Securities Company	4,000	Prop/Trading
Gulfstream Partners	2,500	Money Manager
Taylor Advisors Inc	1,500	Bank Portfolio
WPG Advisors LLC	1,500	
GENYSYS ASSET MGM	1,000	
Sapient Capital	1,000	Money Manager
Mainline West LLC	1,000	Broker/Dealer
Columbia Management	750	Bond Fund
Viking Fund Management	500	
Cumberland Advisors, Inc.	500	SMA
Northwestern Mutual Life	450	Insurance
Cypress Capital Partners	400	SMA
Wise Investments	125	
Belle Haven Investments, L.P.	125	Broker/Dealer
Stock	47,100	Stock
34 Accounts	352,175	

Overall series subscription	2.4x
PAC table subscription	6.0x

Taxable		
Account	Total	Money Type
Loews/CNA Holding	33,675	Insurance
Spring Lake Asset Management	26,625	SMA
OLD ORCHARD CAPITAL MANAGEMENT LP	26,165	
J.P. Morgan Investment Management, Inc.	21,880	Bond Fund
MetLife Investments	21,615	Insurance
Southern Farm Bureau Life Insurance Co.	21,080	Insurance
Americo	14,830	Bank Trust/PWM
Sit Investment Advisors, Inc.	13,375	Bond Fund
40/86 Advisors, Inc.	11,795	Insurance
NEW JERSEY MANUFACTURERS GROUP	11,335	Insurance
FEDERATED MUTUAL INSURANCE COMPANY	6,785	Insurance
Belle Haven Investments, L.P.	6,325	Broker/Dealer
Calamos Advisors	5,010	
Brotherhood Mutual Insurance	4,500	Insurance
FHN Financial Capital Markets	4,000	Broker/Dealer
Individuals	2,455	Individuals
Texas Farm Bureau Mutual	2,000	Insurance
Edward D. Jones & Co.	2,000	Broker/Dealer
Synovus Trust Company	100	Bank Trust/PWM
Cypress Capital Partners	100	SMA
Charles Schwab & Co.	10	Broker/Dealer
Stock	30,000	Stock
22 Accounts	265,660	

Overall series subscription	6.6x
PAC table subscription	3.7x



INDUSTRIAL COMMISSION OF NORTH DAKOTA
RENEWABLE ENERGY PROGRAM

TECHNICAL REVIEWERS' RATING SUMMARY

R-053-B

**REGIONAL ELECTRIC VEHICLE INFRASTRUCTURE
RESILIENCE (REVIR) PLAN**

**Principal Investigator: Dr. Daisy Selvaraj
Request for \$375,000 Total Project Costs \$1,875,000**

TECHNICAL REVIEWERS' RATING SUMMARY				
R-053-B				
REGIONAL ELECTRIC VEHICLE INFRASTRUCTURE				
RESILIENCE (REVIR) PLAN				
Principal Investigator: Dr. Daisy Selvaraj				
Request for \$375,000 Total Project Costs \$1,875,000				
Rating Category	Weighting Factor	Technical Reviewer		Average Weighted Score
		1B	3B	
	Rating			
1. Objectives	9	4	3	31.50
2. Achievability	9	5	5	45.00
3. Methodology	7	4	3	24.50
4. Contribution	7	5	2	24.50
5. Awareness	5	4	4	20.00
6. Background	5	5	4	22.50
7. Project Management	2	3	3	6.00
8. Equipment Purchase	2	5	5	10.00
9. Facilities	2	5	5	10.00
10. Budget	2	4	4	8.00
Average Weighted Score		223	181	202.00
Maximum Weighted Score				250.00

- 1. The objectives or goals of the proposed project with respect to clarity and consistency with North Dakota Industrial Commission/Renewable Energy Council goals are: 1 – very unclear; 2 – unclear; 3 – clear; 4 – very clear; or 5 – exceptionally clear.**

Reviewer 1B (Rating 4)

As the abstract states, this project has the potential to “foster EV sector growth, catalyze investment to diversify North Dakota’s economy, expand use of renewable energy resources, and create renewable energy jobs, wealth, and tax revenues” – all of which is in line with North Dakota Industrial Commission/Renewable Energy Council goals.

The proposal clearly outlines the EV infrastructure resilience challenges the project aims to address, including harsh winter climate, extreme weather events, limited rural distribution grid infrastructure, lack of charging infrastructure, and low EV adoption.

It would have been nice to more explicitly outline the connections between EV charging, grid resilience, and economic development opportunities in line with ND's goals.

Reviewer 3B (Rating 3)

The application makes a clear connection between the resiliency/reliability of the EV charging network and the goals of the NDIC/REC. The connection appears to be public education through learning sessions and public service employee education/awareness of grid/service risks and various mitigation strategies. The application assumes the connection between EV usage and renewable energy usage which is marginal at a best-case scenario.

- 2. With the approach suggested and time and budget available, the objectives are: 1 – not achievable; 2 – possibly achievable; 3 – likely achievable; 4 – most likely achievable; or 5 – certainly achievable.**

Reviewer 1B (Rating 5)

The project has already been selected for award by the U.S. Department of Energy.

In addition, the list of partners that are already committed to participating in the working group is extensive and impressive. With this upfront buy-in from stakeholders, I am confident in the project's ability to achieve its objectives within the proposed time and budget.

Reviewer 3B (Rating 5)

The stated goals are certainly achievable within the budget and timeframe.

- 3. The quality of the methodology displayed in the proposal is: 1 – well below average; 2 – below average; 3 – average; 4 – above average; or 5 – well above average.**

Reviewer 1B (Rating 4)

The methodology is clear and well thought-out.

I would have liked to see more information about what sort of outreach they plan to conduct and how they will prioritize participants for the working group.

Reviewer 3B (Rating 3)

Using the Idaho National Lab risk assessment methodology is excellent and provides a standard to identify and develop mitigation for associated risks. However, there are significant gaps in the working group members from a system.

Cass County REC is the only REC on the EV corridor

Xcel is the only Generation entity

Where are the Workforce training and Labor resources representatives

South Dakota DOT representative

The grant states that members may be added, I would have liked to have seen a list of members the RWG are actively pursuing.

- 4. The scientific and/or technical contribution of the proposed work to specifically address North Dakota Industrial Commission/Renewable Energy Council goals will likely be: 1 – extremely small; 2 – small; 3 – significant; 4 – very significant; or 5 – extremely significant.**

Reviewer 1B (Rating 5)

According to the goals of the North Dakota Industrial Commission/Renewable Energy Council that I was able to find [online](#), this project will directly support these goals in an extremely significant way.

I was particularly interested to learn that “over half of the electricity generated in North Dakota goes to out-of-state customers, most to Minnesota.” This underscores the importance of this regional collaboration.

Reviewer 3B (Rating 2)

The risk assessment will provide a small technical contribution to the NDIC/REC goals by increasing public awareness of the risks and rewards of EV infrastructure in the alt. fuel corridors. It is limited by the number of individuals and groups the outreach portion of the project. The reasoning of the small contribution is that many of the mitigation solutions exist for general grid reliability and equipment availability and need to be in a coherent package.

- 5. The principal investigator’s awareness of current research activity and published literature as evidenced by literature referenced and its interpretation and by the reference to unpublished research related to the proposal is: 1 – very limited; 2 – limited; 3 – adequate; 4 – better than average; or 5 – exceptional.**

Reviewer 1B (Rating 4)

Very little other research/literature was referenced in the proposal, but it’s clear from the PI’s resume that they are exceptionally aware of other research activity in this field.

Reviewer 3B (Rating 4)

The PI and team are engaged in relevant industry and research activities to lead this study.

- 6. The background of the investigator(s) as related to the proposed work is: 1 – very limited; 2 – limited; 3 – adequate; 4 – better than average; or 5 – exceptional.**

Reviewer 1B (Rating 5)

The PI has significant experience with energy infrastructure risk and resilience assessments, distribution system planning and analysis, load flow and hosting capacity analysis, studies on distributed energy resources (DER) impacts, and production cost and energy market simulations, all of which will be critical for this project.

The PI and assistant have already developed a North Dakota grid resilience plan.

Reviewer 3B (Rating 4)

The team appear to have the experience and expertise necessary to complete the assessment, interact with various stakeholder entities, and conduct information sessions.

- 7. The project management plan, including a well-defined milestone chart, schedule, financial plan, and plan for communications among the investigators and subcontractors, if any, is: 1 – very inadequate; 2 – inadequate; 3 – adequate; 4 – very good; or 5 – exceptionally good.**

Reviewer 1B (Rating 3)

There is a proposed project schedule on page 14, but no milestones are included. The budget breakdown on page 15 is not broken down by task, and no concrete communication plan is provided.

Reviewer 3B (Rating 3)

There is a schedule for each task, however there is no spend schedule/financial plan or specific deliverable date list. Communication between parties in indirectly address in the application.

- 8. The proposed purchase of equipment is: 1 – extremely poorly justified; 2 – poorly justified; 3 – justified; 4 – well justified; or 5 – extremely well justified. (Circle 5 if no equipment is to be purchased.)**

Reviewer 1B (Rating 5)

No equipment will be purchased.

Reviewer 3B (Rating 5)

N/A

- 9. The facilities and equipment available and to be purchased for the proposed research are: 1 – very inadequate; 2 – inadequate; 3 – adequate; 4 – notably good; or 5 – exceptionally good.**

Reviewer 1B (Rating 5)

No equipment will be purchased for the project.

Reviewer 3B (Rating 5)

The EERC is well equipped to perform the grant activities.

- 10. The proposed budget “value”¹ relative to the outlined work and the financial commitment from other sources² is of: 1 – very low value; 2 – low value; 3 – average value; 4 – high value; or 5 – very high value. (See below)**

Reviewer 1B (Rating 4)

The project has already received 80 percent of overall project funding from the Joint Office of Energy and Transportation (JOET) within the U.S. Department of Energy (DOE).

North Dakota is being asked to contribute only 20% of overall project funds.

Reviewer 3B (Rating 4)

Addressing the risks and mitigation strategies for placing high power EV chargers in the wild (remote areas accessible to the public) has a value which can be utilized in a number of other important industries.



March 1, 2024

Mr. Reice Haase
Deputy Executive Director
ATTN: Renewable Energy Program
North Dakota Industrial Commission
State Capitol – 14th Floor
600 East Boulevard Avenue, Department 405
Bismarck, ND 58505-0840

Dear Mr. Haase:

Subject: EERC Proposal No. 2024-0126 Entitled “Regional Electric Vehicle Infrastructure Resiliency (REVIR) Plan”

The Energy & Environmental Research Center (EERC) of the University of North Dakota (UND) is pleased to submit this cost-share funding request to the Renewable Energy Program (REP) for the support of the REVIR plan project. The 2-year project has been selected for award by the U.S Department of Energy with a start date of May 1, 2024. The EERC is committed to completing the project on schedule and within budget should the Commission make the requested grant.

The EERC, a research organization within UND, an institution of higher education within the state of North Dakota, is not a taxable entity; therefore, it has no tax liability.

The \$100 application fee (Check No. 2765) for this proposal was sent UPS overnight and was delivered Thursday, February 29, 2024, UPS tracking number 1ZX571891399267934. If you have any questions, please contact me by telephone at (701) 777-5105 or by email at dselvaraj@undeerc.org.

Sincerely,

DocuSigned by:
Daisy Selvaraj
7921E3286EF8479...
Dr. Daisy Selvaraj
Senior Research Engineer, EERC

Approved by:

DocuSigned by:
Charles D. Gorecki
29499751F2B84DZ
Charles D. Gorecki, CEO
Energy & Environmental Research Center

DS/kl

c: Karen Tyler, North Dakota Industrial Commission



Application

Project Title: Regional Electric Vehicle

Infrastructure Resilience (REVIR) Plan

Applicant: Energy & Environmental Research
Center, University of North Dakota

Principal Investigator: Dr. Daisy Selvaraj

Date of Application: March 1, 2024

Amount of Request: \$375,000

Total Amount of Proposed Project: \$1,875,000

Duration of Project: 24 Months

Point of Contact (POC): Dr. Daisy Selvaraj

POC Telephone: (701)-777-5105

POC Email: dselvaraj@undeerc.org

POC Address: 15 North 23rd Street, Stop 9018

Grand Forks, ND 58202-9018

Renewable Energy Program

North Dakota Industrial Commission

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References	Appendix E

ABSTRACT

As electric vehicle (EV) charging infrastructure grows, resiliency planning will be critical to ensure that communities and energy systems are prepared for disruptive natural and manmade events that could compromise access to charging services. Such planning will foster EV sector growth, catalyze investment to diversify North Dakota’s economy, expand use of renewable energy resources, and create renewable energy jobs, wealth, and tax revenues. **Objective:** The Energy & Environmental Research Center (EERC) will lead a consortium of regional stakeholders to develop a Regional Electric Vehicle Infrastructure Resilience (REVIR) plan that has broad support to serve as an actionable, adaptable, and evolving road map to strengthen and maintain secure, reliable, and resilient EV infrastructure in the four-state region (North Dakota, Montana, Minnesota, and South Dakota). **Expected Results:** The REVIR plan will support the North Dakota Industrial Commission (NDIC) Renewable Energy Program’s (REP’s) mission to promote the growth of North Dakota’s vast renewable energy industries through research, development, marketing, and education. The resulting REVIR plan will map the developed networks and working

relationships among stakeholders, communities, and EV interest groups. The proposed work will provide guidance on resilience solutions to enhance the state's EV infrastructure plans as part of the National Electric Vehicle Infrastructure (NEVI) program [1] and other EV programs that can diversify North Dakota's economy, promote its renewable energy resources, and create jobs. **Duration:** 24 months, with an anticipated start date of May 1, 2024. **Total Project Cost:** \$1,875,000, with \$375,000 from NDIC REP, and \$1.5 million from the Joint Office of Energy and Transportation (JOET) within the U.S. Department of Energy (DOE). **Participants:** ND Department of Transportation (DOT), MNDOT, MTDOT, ND Clean Cities, MN Clean Cities Coalition, ND Department of Commerce, ND Department of Emergency Services, MT Department of Environmental Quality, Fargo – Moorhead Metropolitan Council of Governments, Cass County Electric Cooperative, Mountrail–Williams Electric Cooperative, Xcel Energy, ZEF Energy, Connexus Capital LLC, SAGE Development Authority, and Native Sun Community Power Development.

PROJECT DESCRIPTION

The four-state region of Minnesota, Montana, North Dakota, and South Dakota encompasses a unique combination of EV infrastructure resilience challenges including harsh winter climate, extreme weather events, limited rural distribution grid infrastructure, lack of charging infrastructure, and low EV adoption. By leveraging U.S. Department of Energy (DOE) funds and coordinating with ongoing EV charging infrastructure build-out work and programs of the states' DOTs, charging network operators, utilities, planning departments, and community groups, the project team will build a consortium of stakeholders to identify, assess, and devise mitigation strategies to address risks specific to the regional EV charging infrastructure. With the goal of providing practical, achievable, and affordable mitigation strategies, project outcomes will translate to increased charging infrastructure resilience throughout the region. The proposed community benefits plan (CBP) will include sustained engagement with stakeholders, including representatives of tribal nations and disadvantaged communities, to invite participation in actively influencing REVIR plan development.

Objectives. The primary objective of this proposed effort is to provide technical assistance in developing the RE VIR plan by 1) facilitating coordination between interstate, intrastate, and community-level working groups and stakeholders to plan for, respond to, and recover from anticipated and unanticipated disruptions to charging infrastructure availability and services; 2) identifying and addressing regional EV charging risks and providing mitigation strategies for ensuring maximum regionwide EV infrastructure reliability, resilience, and security; and 3) providing guidance to communities and stakeholders in preparing for and adapting to technological and socioeconomic developments in transportation electrification and implementing resilience solutions. Developing, nurturing, and strengthening these relationships will be essential to achieve project objectives and will enable effective response to longer-term opportunities and challenges in the energy industry.

Methodology. The project team will accomplish the proposed work by following a project structure that focuses on engagement and dialogue with all stakeholders involved. As depicted in Figure 1, the RE VIR plan project is designed to feed and coordinate with other efforts in the region. The task structure is developed to provide consistency with the matching project awarded by the Joint Office of Energy and Transportation within the DOE.

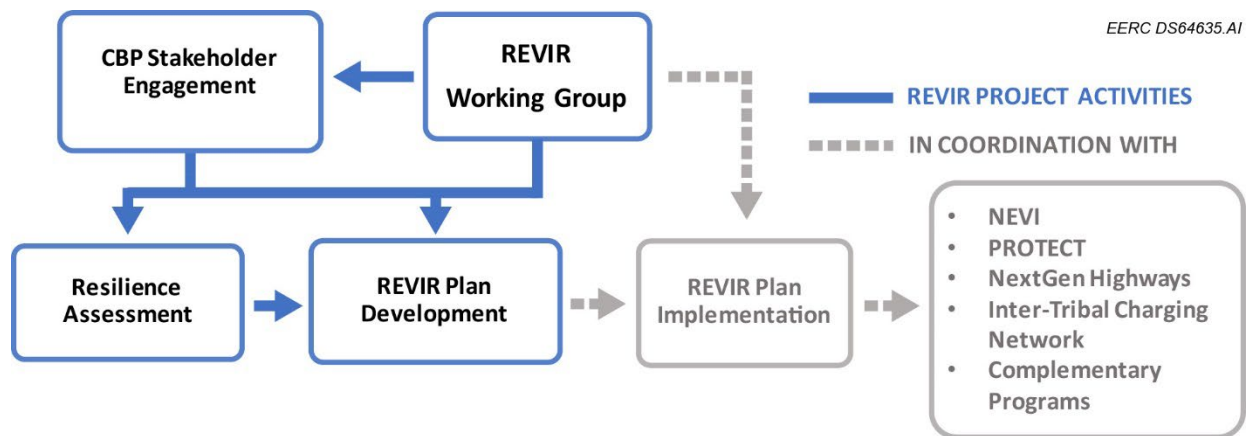


Figure 1. Proposed RE VIR plan project approach.

Task 1 – Creation and Coordination of the RE VIR Working Group (RWG). Resilience planning requires active participation from local government and community representatives, officials, private industries,

and local businesses who have a diverse range of perspectives on EVs and EV infrastructure. An RWG will be created to provide a critical resource for data, technical analysis, and solutions. The RWG will offer strategic leadership, direction, stakeholder engagement, and assistance in REVIR plan development and recommendations for implementing resilience solutions for the regional EV infrastructure. Table 1 lists committed RWG members. Other members may be added over the course of the project.

Table 1. RWG Members

Transportation	Nongovernmental Energy and Consulting
<ul style="list-style-type: none"> • ND Department of Transportation • MN Department of Transportation • MT Department of Transportation • MN Clean Cities Coalition • ND Clean Cities 	<ul style="list-style-type: none"> • Cass County Electric Cooperative • Mountrail–Williams Electric Cooperative • Xcel Energy • ZEF Energy • Connexus Capital LLC
Other State and Regional Agencies	Tribal Relations
<ul style="list-style-type: none"> • ND Industrial Commission • ND Department of Commerce • ND Department of Emergency Services • MT Department of Environmental Quality • Fargo–Moorhead Metropolitan Council of Governments 	<ul style="list-style-type: none"> • SAGE Development Authority (Standing Rock Sioux Tribe) • Native Sun Community Power Development (Red Lake Nation)

Task 2 – CBP Implementation and Stakeholder Engagement. The effort will focus on gathering stakeholder input by identifying and engaging stakeholders, e.g., communities, government agencies, and other groups; industries such as charging station manufacturers/owners, network operators/providers, and EV manufacturers; local businesses, utilities, and policy makers. The CBP will lay the groundwork for a resilient EV charging infrastructure that supports broadly shared prosperity for communities, including workers and tribal nations, by doing the following:

- Soliciting input on goals, current and potential activities, and potential resources for executing the REVIR plan, such as knowledge sharing, lessons learned, and best practices.
- Leveraging outreach by partners to identify stakeholders to participate in plan development.
- Informing stakeholders about EV charging resilience, planning process, and benefits.

The stakeholder engagement activities will include meetings with communities, site hosts, and focus groups; listening sessions; surveys/questionnaires; and information sharing through websites.

Task 3 – Baseline and Risk Assessment of Regional EV Infrastructure. A robust resilience assessment framework is critical for assessing various threats and risks and developing and implementing solutions to address those risks and enhance resilience of the charging infrastructure. Illustrated in Figure 2, development of the framework begins with a *baseline assessment* to understand the current state of the regional EV infrastructure and energy systems and ends with identifying *risk mitigation* strategies. Examples of *threats* are provided in Table 2. *Vulnerabilities* are weaknesses within the charging infrastructure, processes, and supporting systems that may contribute to severe damage when a disruptive event occurs (e.g., lack of cyber defense leads to major economic loss or disruption of critical infrastructures).

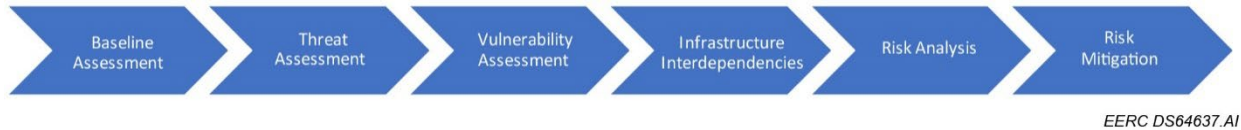


Figure 2. Steps to develop a resilience assessment framework.

Table 2. Threat Categories and Examples

Threats	Examples
Natural	Cold waves, snowstorms, high winds, floods, tornadoes
Technological	Electrical power outages, communication interruption, equipment breakdown
Manmade	Cyberattacks, accidents, vandalism, supply chain interruption

The RWG will consider stakeholder input in modeling additional threat scenarios as applicable to the regional charging infrastructure. For *risk analysis*, Idaho National Lab’s (INL’s) All Hazards Analysis (AHA) tool [2] will be used to simulate the regional threat scenarios and vulnerabilities and analyze the regional risks to the charging infrastructure. Potential mitigation options to reduce vulnerabilities and threats will be assessed for effectiveness along with viability, cost, and potential to reduce risk. The preliminary findings of the risk assessment will be compiled in a draft report to inform stakeholders about the regional EV infrastructure threats, vulnerabilities, and challenges and will be valuable for

involving stakeholders in the subsequent development of resilience solutions (i.e., mitigation strategies). The findings of the risk assessment will be used to 1) refine REVIR plan goals, strategies, and actions that facilitate building a resilient EV infrastructure; and 2) ensure that the REVIR plan is focused on addressing the threats and vulnerabilities and proposing practical solutions.

Task 4 – Development of REVIR Plan. The REVIR plan for the four-state region will comprise the process flow presented in Figure 3. Through stakeholder engagement, the RWG will develop meaningful short- and long-term goals and innovative strategies for translating the conceptual resilience vision to practical and achievable resilience solutions. Clear goals and proactive strategies to achieve these goals will be the foundation for the comprehensive design of the REVIR plan, help communicate efforts to stakeholders, and provide a basis for tracking and measuring success. The REVIR plan will also provide guidance on the implementation of mitigation strategies that include the following components: 1) responsible agency/community, 2) collaborators/partners, 3) preliminary steps for implementation, 4) resources required, 5) potential barriers, and 6) estimated timeline. Stakeholder feedback will inform the final REVIR plan.



EERC DS64640.AI

Figure 3. Process flow of REVIR plan development.

Task 5 – Project Management and Reporting. This task will include all quarterly, interim, and final reporting to project sponsors, including deliverables. Results will be provided in interim and final project reports and at one or more technical conferences.

Anticipated Results. The project will support REP’s mission to promote the growth of North Dakota’s vast renewable energy industries through research, development, marketing, and education. The primary result will be a REVIR plan that showcases the networks and working relationships among stakeholders, communities, and EV interest groups. The proposed work will provide guidance on resilience solutions to enhance the state’s EV infrastructure plans as part of the NEVI program and other

EV programs underway that can diversify North Dakota's economy, create renewable energy jobs, and promote the use of North Dakota's renewable energy resources.

The primary long-term impact of the REVIR plan will be its use as an adaptable tool and framework for enhancing regional EV charging infrastructure reliability, resiliency, and accessibility as EV adoption increases and user patterns and markets evolve. In addition, the working relationships, organizational networks, and engendered trust established during the project will yield beneficial interdependencies and communication pathways that will facilitate preparing for and responding to disruptive events, technology improvements, evolving regulatory environments, social and demographic changes, and other as-yet unforeseen developments in transportation electrification.

Facilities and Resources. The EERC office and meeting rooms will be the main work location. The EERC's computers, communication networks, and clusters can support data storage, analysis, and simulation activities. The other project partners have the facilities and resources available to complete the scope of work. The project team will draw on research experience in infrastructure resilience assessments and electrical-grid-related impacts from EV adoption. In addition, the four states' DOTs have ongoing intrastate efforts to build the EV charging structure under federal programs including the NEVI program, the Promoting Resilient Operations for Transformative Efficient and Cost-saving Transportation (PROTECT) program, and the NextGen Highways program. The proposed work will leverage their collaboration with utilities, planning divisions, state agencies, charging network providers, charger manufacturers, fleet managers, local and tribal communities, and emergency services departments to help develop and implement the REVIR plan. The work will integrate the efforts of nongovernmental infrastructure development. SAGE Development Authority of the Standing Rock Sioux Tribe, Connexus Capital, ZEF Energy, and Native Sun Community Power Development have experience working on the charging network between the Standing Rock Sioux Tribe and Red Lake Nation in Minnesota. Xcel Energy, Cass County Electric Cooperative, and Mountrail-Williams Electric Cooperative will provide

utility perspectives on EV charging demand, load growth, and grid reliability issues. ND Department of Emergency Services manages the state's Critical Infrastructure Program and will inform emergency planning. ND Clean Cities, MN Clean Cities Coalition, Fargo–Moorhead Metropolitan Council of Governments, ND Department of Commerce, and MT Department of Environmental Quality will support REVIR plan development. No equipment will be purchased for this project.

Techniques To Be Used, Their Availability and Capability. The project will use INL's AHA tool for resilience assessment, which INL has agreed to provide with required data on regional infrastructures.

Environmental and Economic Impacts while Project is Underway. The project comprises data gathering and analysis, computer simulation modeling, surveys/questionnaires, and paper studies. Environmental and economic impacts of the project will be minimal.

Ultimate Technological and Economic Impacts. The proposed project will support North Dakota's vision to promote the growth of North Dakota's renewable energy industries by improving the resiliency and thus increasing the reliability of electrified transportation. The proposed work will guide implementation of resilience solutions that can promote investment in EV infrastructure with the forethought to integrate resiliency, reliability, and security as well as partner with stakeholders who seek to develop resilient and independent energy systems into the future. The proposed project will foster sustainable growth of a resilient EV sector that can diversify North Dakota's energy economy, better leverage renewable energy resources, and create additional energy- and transportation-related jobs.

Why the Project Is Needed. North Dakota has a unique combination of EV infrastructure resilience challenges, including expansive sparsely populated geography, harsh winter climate, extreme weather events, personal-vehicle-dominated road transportation, and limited rural electric grid infrastructure. The region has relatively low EV adoption compared to national trends. Many of the plug-in-electric vehicles (PEVs) registered in the region are found in major urban areas, with few vehicles present in the more rural areas. The region also has limited EV charging infrastructure. Considering the number of

public charging ports per 10,000 people for each state, the average figure for North Dakota is 2.3, which is less than the national average of 2.9 ports/10,000 people and far less than leading states (e.g., about 7–21 in California) [3-4]. Most of the region has less than one charging station for every 50 miles along the designated alternative fuel corridors. Because of the lack of EV charging infrastructure, the study region is referred to as a charging desert, and this may cause concerns to EV-driving road trippers and tourists. Given the low EV adoption and minimal EV infrastructure deployment to date, resilience and reliability issues have yet to emerge. The REVIR plan will facilitate the proactive development of a built-from-scratch resilience system, saving time, money, and lives in the future.

By leveraging and coordinating with ongoing EV charging infrastructure build-out work and programs of the states' DOTs, charging network operators, utilities, planning departments, and community groups, the project team will lead a consortium of stakeholders to identify, assess, and devise mitigation strategies to address risks specific to the regional EV charging infrastructure. With the goal of providing practical, achievable, and affordable mitigation strategies, project outcomes will translate to increased charging infrastructure resilience throughout North Dakota and the four-state region and will offer significant applicability to resilience plans for other regions. The proposed work will provide guidance on the implementation of resilience solutions to enhance state DOT EV infrastructure plans as part of the NEVI program, PROTECT program, NextGen Highways program, and intertribal charging networks already underway in the region.

STANDARDS OF SUCCESS

Success first requires delivery of a REVIR plan that has sufficiently broad and deep stakeholder support to serve as an actionable, adaptable, and continually evolving road map for strengthening and maintaining a secure, functioning, and resilient EV infrastructure in North Dakota and the region. The success metric will be the extent to which REVIR plan stakeholders and EV users are committed to implementing and building on the plan, as demonstrated by willingness to fund and participate in

postproject working group(s) as needed to 1) keep the plan alive, 2) turn its directives and strategies into actions, and 3) achieve its objectives in the form of infrastructure, hardware, grid and resource management, operational strategies and policies, outreach and education, and increased EV adoption.

The resilience of EV charging stations will depend directly on the resilience of the electric utility serving the charging station. A substantial weather-induced power outage could shut down charging infrastructure and compromise consumer access with likely economic implications. In addition to weather and other uncontrollable threats, large-scale variations in demand profiles caused by unmanaged EV charging loads may lead to grid resource adequacy shortfalls and create needs for planned, rolling blackouts. A primary REVIR plan objective is to help build and maintain working groups (comprising EV industry, user, and community stakeholders) capable of 1) monitoring charging infrastructure use and performance, 2) regularly assessing risks to infrastructure availability, and 3) developing and implementing mitigation strategies to maximize infrastructure reliability and minimize downtime following an unavoidable shutdown.

VALUE TO NORTH DAKOTA

According to the Lignite Energy Council, over half of the electricity generated in North Dakota goes to out-of-state customers, most to Minnesota. Minnesota's new carbon-free energy standard (enacted by Minnesota lawmakers in 2023) requires Minnesota utility providers to transition to 100% carbon-free electricity sources by 2040. Twin Cities EV users will likely soon represent a major new and fast-growing power demand center. Therefore, demand for low-carbon power is growing in the immediate region. Cross-state industry–user–community alliances formed and guided by a working/living REVIR plan will help ensure continuing and expanded flow of North Dakota power to Minnesota, South Dakota, and Montana customers, benefiting North Dakota and its neighbors. Build-out of EV infrastructure will also yield greater connectivity within the region, allowing for EV travel corridors that enhance tourism

opportunities and ensuring economic stability, growth, and opportunity in the renewable energy industry.

BACKGROUND/QUALIFICATIONS

The EERC will draw on extensive experience successfully managing multimillion-dollar contracts involving myriad regulatory, industry, and nongovernmental partners to lead the project and manage tasks with input and support from the project partners to accomplish task goals and objectives. The principal investigator (PI) is Dr. Daisy F. Selvaraj, Senior Research Engineer at the EERC. Dr. Selvaraj will manage the project planning and reporting activities. Her research focuses on energy infrastructure risk and resilience assessment, distribution system planning and analysis, load flow and hosting capacity analysis, studies on distributed energy resources (DER) impacts, and production cost and energy market simulations. Dr. Selvaraj will be assisted by Mr. Bradley G. Stevens, Principal Research Engineer, Civil Engineering at the EERC. Mr. Stevens' principal areas of interest and expertise include soil, groundwater, and industrial process water remediation; process instrumentation and control; wind power generation; hydrogen production; and oil and gas production. Dr. Selvaraj and Mr. Stevens worked on the development of a North Dakota grid resilience plan. The team's prior work also includes the Military Installation Resilience Study for the Grand Forks Air Force Base. Ms. Charlene R. Crocker, Senior Research Scientist and Outreach Team Lead at the EERC, will lead Task 2. Ms. Crocker's principal areas of interest and expertise span public outreach and scientific research activities over more than 30 years, including energy transformations and emissions control, CO₂ capture and storage, and water quality. Resumes of key personnel can be found in Appendix A.

MANAGEMENT

The EERC will oversee all tasks, schedule regular internal and external meetings with project participants, and ensure that the project is conducted using acceptable scientific methodologies and practices in accordance with the project plan (budget, schedule, and deliverables) and is meeting quality

objectives. The EERC will keep all partners informed of project progress, coordinate activities for successful project execution, and be responsible for timely submission of all project deliverables and products to the project team. Progress reports will be prepared and submitted to project sponsors for review. A broad team approach is key to successful execution of this project.

TIMETABLE

This project will be performed over 24 months. It is anticipated that DOE funds will be available by May 1, 2024, to initiate the project. Figure 4 depicts the proposed project schedule.

Tasks	Year 1				Year 2			
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Task 1 – Creation and Coordination of REVIR Working Group (RWG)								
Task 2 – CBP Implementation and Stakeholder Engagement								
Task 3 – Baseline and Risk Assessment of Regional EV Infrastructure								
Task 4 – Development of REVIR Plan								
Task 5 – Project Management and Reporting								

Figure 4. Proposed project schedule.

BUDGET

The total estimated cost for the proposed work is \$1,875,000, as presented in Table 3. The EERC requests \$375,000 from REP to be matched with \$1,500,000 from JOET within DOE. Letters of support are provided in Appendix B. Budget notes can be found in Appendix C.

TAX LIABILITY. The EERC is a business unit within UND, which is a state-controlled institution of higher education and is not a taxable entity; therefore, the EERC has no tax liability.

CONFIDENTIAL INFORMATION. No confidential information is included in this proposal.

PATENTS/RIGHTS TO TECHNICAL DATA. It is not anticipated that any patents will be generated during this project. The rights to technical data generated will be held jointly by the EERC and project sponsors.

STATE PROGRAMS AND INCENTIVES. A listing of EERC projects funded by NDIC in the last 5 years can be found in Appendix D.

REFERENCES. All references cited are in Appendix E.

Table 3. Budget Breakdown

Project Associated Expense	NDIC Share (Cash)	DOE Share (Cash)	Total Project
Direct Costs			
Labor	\$239,514	\$801,638	\$1,041,152
Travel	\$-	\$26,072	\$26,072
Supplies	\$800	\$6,970	\$7,770
Subcontractor – Matthew Stolz	\$-	\$40,000	\$40,000
Communications	\$-	\$6,566	\$6,566
Printing and Duplicating	\$-	\$2,926	\$2,926
Food	\$-	\$2,508	\$2,508
Rents and Leases – Venue Rental	\$-	\$1,200	\$1,200
Honorarium	\$-	\$2,000	\$2,000
Document Production Services	\$7,130	\$98,318	\$105,448
Technical Software Fee	\$-	\$8,996	\$8,996
Engineering Services Fee	\$900	\$9,796	\$10,696
Total Direct Costs	\$248,344	\$1,006,990	\$1,255,334
Facilities and Administration	\$126,656	\$493,010	\$619,666
Total Project Costs	\$375,000	\$1,500,000	\$1,875,000

APPENDIX A

RESUMES OF KEY PERSONNEL

DR. DAISY F. SELVARAJ

Senior Research Engineer

Energy & Environmental Research Center (EERC), University of North Dakota (UND)

15 North 23rd Street, Stop 9018, Grand Forks, North Dakota 58202-9018 USA

701.777.5105, dselvaraj@undeerc.org

Education and Training

Ph.D., Electrical Engineering, Visvesvaraya Technological University, Belagavi, India, 2018.

M.E., High-Voltage Engineering, College of Engineering Guindy, Anna University, Tamil Nadu, India, 2008.

B.E., Electrical and Electronics Engineering, Bharathidasan University, India, 1999.

Research and Professional Experience

2022–Present: Senior Research Engineer in the Energy Systems Group at the EERC, UND. Dr. Selvaraj's research focuses on distribution system planning and analysis, load flow and hosting capacity analysis, studies on distributed energy resources (DER) impacts, and production cost and energy market simulations. Her current research activities include a grid resilience study for the State of North Dakota and also energy storage modeling for a U.S. Department of Energy (DOE) project on ammonia storage. As a competent researcher and technical leader, Dr. Selvaraj has created strong collaborative engineering teams with national labs, government agencies, and utility partners. She has developed a number of new ideas and proposals over the years that led to successful research and business capabilities and subsequent funding from federal and state agencies. In addition, Dr. Selvaraj teaches Electrical Engineering graduate and undergraduate courses in the UND Department of Electrical Engineering as well as provides academic advising and mentoring to students.

2019–2022: Research Engineer, EERC, UND.

2018–2019: Postdoctoral Research Associate, School of Electrical Engineering & Computer Science, UND.

2017–2018: Assistant Professor, Department of Electrical and Electronics Engineering, Presidency University, Karnataka, India.

2013–2017: Senior Research Fellow, R&D Management Division, Central Power Research Institute, Karnataka, India.

2010–2013: Assistant Professor, Department of Electrical and Electronics Engineering, Rajiv Gandhi Institute of Technology, Karnataka, India.

2006–2008: Master's Degree Candidate, College of Engineering Guindy, Anna University, Tamil Nadu, India.

2003–2006: Lecturer, Department of Electrical and Electronics Engineering, J.J College of Engineering and Technology, Tamil Nadu, India.

2002: Production Engineer, Baby Industries, Tamil Nadu, India.

2000–2001: Programmer, Sierratronic India Pvt. Limited, Tamil Nadu, India.

Professional Activities

Member, Institute of Electrical and Electronics Engineers (IEEE)

Member, Indian Society for Technical Education

Reviewer, *IEEE Access*

Reviewer, DOE Artificial Intelligence and Decision Support for Complex System Review, July 2020.

Session Chair, Special Session on Electric Vehicles, Emerging Topics Track, 2019 North American Power Symposium (NAPS), Wichita, Kansas, USA, October 2019.

Reviewer, 2019 NAPS, Wichita, Kansas, USA, October 2019.

Reviewer, *IEEE Wireless Communications Magazine*

Reviewer, *IEEE Access*

Reviewer, *Elsevier Thermal Science and Engineering Progress*

Reviewer, *Elsevier Corrosion Science*

Reviewer, *MDPI Energies*

Publications

Mehrasa, M.; Salehfar, H.; Selvaraj, D.F.; Ahmed, S. I. Smart Bidirectional Charging for Frequency Support of a Low-Inertia Vehicle-To-Grid System in Presence of Energy Storage Systems Paper presented at 2023 IEEE Texas Power and Energy Conference (TPEC), College Station, TX, USA, 2023, pp. 1–6, doi: 10.1109/TPEC56611.2023.10078605.

Mehrasa, M.; Selvaraj, D. F.; Salehfar, H. Robust Control Strategy for a High-Power Off-Board EV Charger Connected to Grid-Tied Critical Loads. Paper presented at 2023 IEEE TPEC, College Station, TX, USA, 2023, pp. 1–6, doi: 10.1109/TPEC56611.2023.10078516.

Ibne Ahmed, S.; Salehfar, H.; Selveraj, D.F. Grid Integration of PV Based Electric Vehicle Charging Stations: A Brief Review. Paper presented at 2022 North American Power Symposium (NAPS), Salt Lake City, UT, USA, 2022, pp. 1–6, doi: 10.1109/NAPS56150.2022.10012159.

Mehrasa, M.; Hajar, K.; Razi, R.; Labonne, A. Fuzzy Logic-Based Charging Strategy for Frequency Control of an Electric Vehicles-Integrated Weak Grid. Paper presented at 2022 IEEE International Conference on Electrical Sciences and Technologies in Maghreb (CISTEM), Tunis, Tunisia, 2022, pp. 1–6, doi: 10.1109/CISTEM55808.2022.10044057.

Ahmed, S.I.; Salehfar, H.; Selvaraj, D.F. PV Hosting Capacity Assessment for Improved Planning of Low-Voltage Distribution Networks. Paper presented at 2021 NAPS, College Station, TX, Nov 14–16, 2021. DOI: 10.1109/NAPS52732.2021.9654614.

Ahmed, S.I.; Salehfar, H.; Selvaraj, D.F. Impact of Electric Vehicle Charging on the Performance of Distribution Grid. Paper presented at 2021 IEEE 12th International Symposium on Power Electronics for Distributed Generation Systems (PEDG), Chicago, IL, Jun 28 – Jul 1, 2021. DOI: 10.1109/PEDG51384.2021.9494268.

Bissing, D.; Klein, M.T.; Chinnathambi, R.A.; Selvaraj, D.F.; Ranganathan, P. A Hybrid Regression Model for Day-Ahead Energy Price Forecasting. *IEEE Access* **2019**, *7*, 26833–36842. DOI: 10.1109/ACCESS.2019.2904432.

El Mrabet, Z.; Selvaraj, D.F.; Ranganathan, P. Adaptive Hoeffding Tree with Transfer Learning for Streaming Synchrophasor Data Sets. *In Proceedings of 2019 IEEE International Conference on Big Data (Big Data)*, p. 5697–5704.

El-Rewini, Z.; Sadatsharan, K.; Sugunaraaj, N.; Selvaraj, D.F.; Plathottam, S.J.; Ranganathan, P. Cybersecurity Attacks in Vehicular Sensors. *IEEE Sensors Journal* **2020**, *20* (22), 13752–13767. DOI: 10.1109/JSEN.2020.3004275.

El-Rewini, Z.; Sadatsharan, K.; Selvaraj, D.F.; Plathottam, S.J.; Ranganathan, P. Cybersecurity Challenges in Vehicular Communications. *Vehicular Communications* **2020**, *23*, 100214

Synergistic Activities

1. Dr. Selvaraj is currently leading the EERC’s diverse research portfolio that includes development of modeling schemes and control strategies for smart grid, grid integration of renewable energy systems and electric vehicles (EVs), hardware-in-the-loop testing, and data analytics for smart grid. Her work is supported by DOE and other leading federal and state funding agencies and private industry partners.
2. Dr. Selvaraj is coordinating current efforts for the development of a North Dakota energy resilience plan to address resilience risks associated with widespread and long-term electrical power outages in North Dakota.
3. Dr. Selvaraj was instrumental in the installation resilience study at Grand Forks Air Force Base.
4. Dr. Selvaraj has collaborated with North Dakota power distribution companies to support research on addressing broad grid integration issues with EVs. Through her collaborative approach, UND, along with regional partners, is establishing priorities, direct research, and development activities to address the technical challenges associated with increasing EV utilization across the state.
5. As a merit/panel reviewer, Dr. Selvaraj has reviewed DOE proposals for Artificial Intelligence and Decision Support for Complex Systems & Connected Communities.

BRADLEY G. STEVENS, P.E.

Principal Research Engineer, Civil Engineering
Energy & Environmental Research Center (EERC), University of North Dakota (UND)
15 North 23rd Street, Stop 9018, Grand Forks, North Dakota 58202-9018 USA
701.777.5293, bstevens@undeerc.org

Education and Training

B.S., Civil Engineering, University of North Dakota, 1989.
Registered Professional Engineer – North Dakota No. PE-4340.

Research and Professional Experience

2022–Present: Principal Research Engineer, Civil Engineering, EERC, UND. Responsibilities include managing a variety of projects and tasks in the areas of oil and gas production and processing, hydrogen production and utilization, electrical grid resiliency, and risk mitigation. Expertise includes soil, groundwater, and industrial process water remediation; process instrumentation and control; wind power generation; hydrogen production; and oil and gas production.

2021–2022: Senior Research Engineer, Civil Engineering Team Lead, EERC, UND.

2011–2021: Senior Research Engineer, EERC, UND. Mr. Stevens' responsibilities included execution of wide-ranging projects under the EERC's Bakken Production Optimization Program, including the study of alternative natural gas use, saline and hydrocarbon soil remediation, and statistical analysis of various oil and gas industry segments.

2005–2011: Research Manager/Engineer, EERC, UND. Mr. Stevens' responsibilities included management of the EERC's Plains Organization for Wind Energy Resources® (POWER®) wind energy program. POWER management duties included strategic planning, fiscal management, program presentation, proposal preparation, and personnel management. In addition, technical duties included installation and setup of wind-monitoring equipment, assessment and analysis of wind resource data, wind turbine production estimates, and theoretical project economics. Other responsibilities included supervision of the design, installation, and operation of an electrolysis-derived hydrogen production and dispensing system.

1998–2005: Research Engineer, Remediation, EERC, UND. Mr. Stevens' responsibilities included the following: management, testing, data analysis, and report preparation for the commercial application of a centrifugal membrane filtration; project management, specification, construction, and demonstration of a freeze-thaw process for the utilization of marginal waters; participation in the Red River Water Management Consortium (RRWMC) as a technical staff member advising RRWMC members regarding pertinent water supply and water quality issues; management and operation of data analysis and report preparation for a sorption and regeneration process for mercury removal from primary and secondary liquid wastes assessment; and data analysis activities related to wind energy.

1992–1998: Project Manager/Engineer, Summit Envirosolutions, Inc., Minneapolis, Minnesota. Mr. Stevens' responsibilities included the following: specification and coordination of the installation of remote data acquisition equipment for municipalities in Minnesota for use as aquifer resource management tools; specification, installation, and maintenance of groundwater flow control and flow measurement equipment in association with a research and development cooperative agreement with NASA involving state-of-the-art methods of remote data acquisition, patented as RealFlow®; design,

installation, and maintenance of permanent and mobile remediation systems in Minnesota, Wisconsin, Nevada, and Arizona, including groundwater pump-and-treat systems, soil vapor extraction systems, and coupled air sparging–soil vapor extraction systems; and management of 20 projects in Minnesota, Wisconsin, and Illinois involving mechanical and electrical control and data retrieval for remedial systems including telemetry-based remedial systems. Other pertinent experience included work with programmable logic controllers and ladder logic programming and training in the use of Intellution FIX DMACS human–machine interface software.

1990–1992: Project Engineer, Delta Environmental Consultants, Inc., St. Paul, Minnesota. Mr. Stevens' responsibilities included the design, permitting, installation, and operation of treatment systems for remediation of contaminated groundwater and soils. Sites ranged from automotive service stations to railroad maintenance yards for projects located in a five-state region. Remediation technologies included subsurface air sparging and soil vapor extraction. Other project responsibilities included data interpretation and permit compliance for 14 remediation systems for a major oil company; supervising excavation of contaminated soils; and permitting and supervising in-place abandonment of a 12,000-gal underground storage tank.

1988–1990: Research/Engineering Technician, EERC, UND. Mr. Stevens' responsibilities included the design, construction, operation and maintenance, data collection and reduction, and formal report preparation for bench-scale treatability programs involving single-stage, two-stage, coupled nitrification–denitrification activated sludge systems, activated carbon adsorption, and ion exchange treatment of coal-processing waters. He maintained and operated the pure oxygen plug flow reactor for the biological treatment of synthetic wastewater. He also assisted in production of a pilot-scale wastewater treatment facility and design and analysis of bench-scale wastewater treatment models.

Patents

Barrett, D.P.; Davis, R.J.; Dustman, J.E.; Gibas, D.R.; Stevens, B.G.L.; Wilson, B.T. Measuring System for Measuring Real-Time Groundwater Data. U.S. Patent 5,553,492, Sept 10, 1996.

Publications

Mr. Stevens has authored or coauthored numerous publications.

CHARLENE R. CROCKER

Senior Research Scientist, Outreach Team Lead
Energy & Environmental Research Center (EERC), University of North Dakota (UND)
15 North 23rd Street, Stop 9018, Grand Forks, North Dakota 58202-9018 USA
701.777.5018, ccrocker@undeerc.org

Education and Training

B.S., Chemistry, University of North Dakota, 1994; B.A., French, Colby College, Waterville, ME, 1986.

Research and Professional Experience

2002–Present: Senior Research Scientist, Outreach Team Lead, EERC, UND, Grand Forks, ND. Performs managerial and principal investigator duties for projects related to scientific research and public outreach. Outreach work has included development of programs for CO₂ sequestration, water, and fish advisories and development of CO₂ sequestration public outreach materials, water quality education, and water-based geoscience education program and outreach activities for middle and high school students. Research has included projects related to development of sorbents for emission control strategies in fossil fuel-fired energy systems; projects related to environmental management and air quality; collaborations in air and water monitoring, bioassessment tools, market research; proposal and report writing; data analysis; presentation of results; and budget tracking. Serves as the Energy Hawks Internship Program Coordinator and Supervisor, State Energy Research Center at the EERC; develops and implements energy literacy syllabus for multidisciplinary team of graduate and undergraduate students in 10-week internship program; guides development of white papers focused on value-added energy topics for North Dakota.

1994–2002: Research Chemist, EERC, UND. Managed projects relating to environmental management and air quality; collaborated with other scientists on fish consumption survey development, air sampling, coal ash, water purification, and surface decontamination research; wrote proposals and reports, analyzed data, presented results, and tracked budgets; developed air sampling protocols; participated in development of water-based geoscience education program and outreach activities for school children. Performed research on ultratrace elemental analyses on water and energy-related samples and followed quality control procedures.

1993–1994: Research Assistant, EERC, UND. Prepared and analyzed inorganic media for ultratrace elements, including mercury, and prepared reagents and solutions.

1990: Naturalist, Deep Portage Conservation Reserve, Hackensack, MN. Planned and conducted environmental education programs for children and adults; evaluated curriculum.

1988–1990: Sanctuary Manager, Wetlands, Pines & Prairie Audubon Sanctuary, Warren, MN. Planned and conducted environmental education programs, organized chapter meetings, published Sanctuary newsletter, and performed administrative tasks.

1988: Park Ranger/Interpreter, Boston Harbor Islands State Park, Boston, MA. Interpreted natural and human history, developed special programs, and conducted tours and school programs.

Relevant Publications

Crocker, C.R.; Krueger, N.M. Energy and CO₂ Management: Carbon Capture and Storage. Presented at 2023 Lignite Education Seminar, Bismarck, ND, June 13, 2023.

Crocker, C.R.; Leroux, K.M.; Massmann, N.M.; Crossland, J.L.; Manthei, M.M.; Glazewski, K.A.; Daly, D.J.; Hamling, J.A. Public Outreach Package for Carbon Capture and Storage in North Dakota; Task 5 Deliverable D3 for North Dakota Industrial Commission Contract No. R-038-047; EERC, Feb 2020.

Daly, D.J.; Crossland, J.L.; Crocker, C.R. Glazewski, K.A.; Massmann, N.M.; Peck, W.D. North Dakota CarbonSAFE Updated Outreach Plan Phase II, May 2019.

- Crocker, C.R.; Daly, D.J. Low-Carbon Energy for North Dakota [documentary short]; Dambach, B.; Olien, M., Site Producers; Prairie Public Broadcasting (PPB): Fargo, ND, and EERC, 2019.
- Crocker, C.R.; Daly, D.J. Coal: Engine of Change [DVD]; Dambach, B.; Steadman, E.N., Executive Producers; PPB and EERC, 2018.
- Daly, D.J.; Crocker, C.R.; Crossland, J.L.; Massmann, N.M.; Peck, W.D. North Dakota Integrated Carbon Storage Complex Feasibility Study; Deliverable D3 (Outreach Toolkit) for U.S. Department of Energy (DOE) Cooperative Agreement (CA) DE-FE0029488; EERC: Grand Forks, ND, Feb 2018.
- Daly, D.J.; Crossland, J.L.; Crocker, C.R.; Gorecki, C.D. Outreach Action Plan; Plains CO₂ Reduction (PCOR) Partnership Phase III Task 2 Deliverable D11 (Update 2) for DOE National Energy Technology Laboratory CA DE-FC26-05NT42592; EERC Publication 2016-EERC-09-02; March.
- Daly, D.J.; Crocker, C.R.; Gorecki, C.D. Regionwide Outreach in a Project-Level World – Lessons from the PCOR Partnership. *Energy Procedia* **2017**, *114*, 7224–7236.
- Crocker, C.R.; Daly, D.J.; Dambach, B.; Pearson, B.; Anderson, D. A Collaboration among PPB, Classroom Teachers, and the PCOR Partnership to Produce Classroom-Ready CCS Lessons. Presented at the International Workshop on Public Education, Training, and Community Outreach for Carbon Capture, Utilization, and Storage, Decatur, IL, July 30, 2014.

Synergistic Activities

- Outreach Team Lead (Oct 2018–present)/member of ND CarbonSAFE team (Phases II and III) since inception in June 2017, developing and implementing project outreach plan, facilitating Outreach Advisory Board, developing outreach materials, engaging educators and K–12 to postsecondary students on carbon capture and storage (CCS), and providing input and guidance to project timelines, budgets, and objectives.
- Outreach Team Lead (Jan 2019–Nov 2021)/member of RTE Ethanol CCS project since 2017, developing and implementing project outreach plan; developing outreach materials; handling media, talking points, and logistics for county commission appearances; preparing landowner packets and public notices for seismic surveys, environmental sampling events, and research results; overseeing logistics, preparing advertising, and developing materials for community open houses; and providing input and guidance to project timelines, budgets, and objectives.
- Outreach Team member for Regional Carbon Sequestration Partnerships (RCSP) Initiative’s PCOR Partnership Program since inception in 2003.
- Associate Producer and Cowriter for seven CCS-related public television documentaries—*Coal: Engine of Change*, *The Bell Creek Story: CO₂ in Action*, *Global Energy and Carbon: Tracking Our Footprint*, *Managing Carbon Dioxide: The Geologic Solution*, *Out of the Air – Into the Soil: Land Practices That Reduce Atmospheric Carbon Levels*, *Reducing Our Carbon Footprint: The Role of Markets*, *Nature in the Balance: CO₂ Sequestration*.
- Codeveloped six outreach plans, 23 outreach posters, numerous fact sheets, general public and educational presentations, and a website focused on aspects of CCS and CCS projects.

APPENDIX B
LETTERS OF SUPPORT

NORTH
Dakota | Transportation
Be Legendary.

July 19, 2023

Ms. Daisy Selvaraj
Senior Research Engineer
University of North Dakota
Energy & Environmental Research Center
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

Dear Ms. Selvaraj:

Subject: Energy & Environmental Research Center Proposal in Response to DOE-NETL-EERE-DOT-JOINT-OFFICE-DE-FOA-0002881

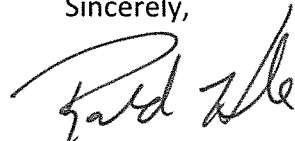
Dear Ms. Selvaraj

This letter is to express North Dakota Department of Transportation's support of the Energy & Environmental Research Center's (EERC) subject proposal being submitted to the U.S. Department of Energy (DOE).

The proposed EERC project will develop and implement a regional Electric Vehicle (EV) infrastructure resilience plan that can assess the current and future threats and risks to regional EV charging infrastructure and provide solutions to ensure the continuity of operations and services of EV infrastructure and maximize benefits to all EV users in North Dakota, South Dakota, Montana, and Minnesota.

We look forward to working with the EERC team and other project partners. Your point of contact for this project if awarded is Russ Buchholz, who can be reach at (701) 328-2561.

Sincerely,



Ronald J. Henke, PE
Director



Minnesota Department of Transportation
Office of Sustainability and Public Health
395 John Ireland Blvd
Mail Stop 245
St. Paul, MN 55055

August 2, 2023

Ms. Daisy Selvaraj, Senior Research Engineer
University of North Dakota -Energy & Environmental Research Center
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

Dear Ms. Selvaraj

This letter is to express Minnesota Department of Transportation's (MnDOT) support of the Energy & Environmental Research Center's (EERC) proposal being submitted to the U.S. Department of Energy (DOE).

In 2007, Minnesota passed the bi-partisan Next Generation Energy Act (NGEA), which established goals for the state to reduce greenhouse gas emissions by 15% below 2005 levels by 2015, 30% by 2025, and 80% by 2050. However, the state did not meet the 2015 goal and is not on track to meet our future goals. Transportation became the largest emitter of carbon pollution in the state in 2016. Electrification of transportation is a key strategy to reduce green house gas emissions from transportation. The EERC project will also support the MnDOT Office of Sustainability and Public Health's five focus areas that connect back to agency and statutory transportation and climate goals.

Participation in this project will provide resilience solutions to enhance the implementation of Minnesota's Electric Vehicle Infrastructure Plan as part of the National Electric Vehicle Infrastructure Program. MnDOT can offer learnings from our use of rights of way to support decarbonization of transportation and energy – an effort called NextGen Highways.

MnDOT can provide an in-kind match in the form of staff time to participate in working group meetings, contribute information and data as available, assist in implementation of resilience solutions as fits with our EV Infrastructure plan. We look forward to working with the EERC team and other project partners if awarded.

Sincerely,

Amber Dallman
Digitally signed by Amber
Dallman
Date: 2023.08.02 10:48:58
-05'00'

Amber Dallman
Office of Sustainability and Public Health Director

CC: Beth Kallestad, Principal Sustainability Planner Siri Simons, Sustainability Program Supervisor
Jessica Oh, Strategic Partnerships Director Anna Pierce, Interim Sustainability Program Supervisor

Equal Opportunity Employer



Malcolm D. Long, Director

2701 Prospect • PO Box 201001
Helena MT 59620-1001

July 19, 2023

Ms. Daisy Selvaraj
Senior Research Engineer
University of North Dakota
Energy & Environmental Research Center
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

Subject: Energy & Environmental Research Center Proposal in Response to DOE-NETL-EERE-DOT-JOINT-OFFICE-DE-FOA-0002881

Dear Ms. Selvaraj,

This letter is to express the Montana Department of Transportation's (MDT) support of the Energy & Environmental Research Center's (EERC) subject proposal being submitted to the U.S. Department of Energy (DOE).

The proposed EERC project will develop and implement a regional Electric Vehicle (EV) infrastructure resilience plan that can assess the current and future threats and risks to regional EV charging infrastructure and provide solutions to ensure the continuity of operations and services of EV infrastructure and maximize benefits to all EV users in North Dakota, South Dakota, Montana, and Minnesota. MDT appreciates the collaborative nature of this study, which plans to a working group with key stakeholders from the region that will come together to create recommendations to produce a flexible implementation plan that meets each state's unique needs.

As the agency responsible for managing and improving Montana's transportation system, we recognize the growing importance of EVs. With the rising adoption of EVs, it is crucial to assess and enhance the resiliency of our infrastructure to support transportation across the state. This research aligns closely with our own mission to innovate at all levels and invest in infrastructure that can accommodate the evolving needs of Montana's residents and visitors. Based on our mutual interests, we support the proposed project in the form of providing staff time, roadway data and statewide EV information. We look forward to working with the EERC team and the outcomes and insights that will emerge from this research, which will undoubtedly inform our future transportation planning and resiliency efforts.

Sincerely,

A handwritten signature in blue ink that reads "Malcolm D. Long". The signature is written in a cursive style.

Malcolm D. Long, Director
Montana Department of Transportation



July 19, 2023

Ms. Daisy Selvaraj
Senior Research Engineer
University of North Dakota
Energy & Environmental Research Center
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

Dear Ms. Selvaraj:

Subject: Energy & Environmental Research Center Proposal in Response to DOE-NETL-EERE-DOT-JOINT-OFFICE-DE-FOA-0002881

This letter is to express the commitment of Minnesota Clean Cities Coalition and North Dakota Clean Cities to the Energy & Environmental Research Center's (EERC's) subject proposal being submitted to the U.S. Department of Energy (DOE).

The proposed EERC project will develop and implement a regional electric vehicle (EV) infrastructure resilience plan that can assess the current and future threats and risks to regional EV charging infrastructure, provide solutions to ensure the continuity of operations and services of EV infrastructure, and maximize benefits to all EV users in North Dakota, South Dakota, Montana, and Minnesota.

Our Clean Cities coalitions have been active in developing the region's current EV charging ecosystem and strive to accelerate its growth. We currently lead or support several DOE-funded electric vehicle projects that are active in the region and work with a wide variety of relevant stakeholders in our states. Based on our mutual interests, we are proud to support the proposed project and partner with EERC to develop and implement the resilience plan. We look forward to working with the EERC team and other project partners if awarded.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jon Hunter".

Jon Hunter
Interim Director
North Dakota Clean Cities

A handwritten signature in blue ink, appearing to read "Lisa Thurstin".

Lisa Thurstin
Director
Minnesota Clean Cities Coalition



July 12, 2023

Ms. Daisy Selvaraj
Senior Research Engineer
University of North Dakota
Energy & Environmental Research Center
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

Dear Ms. Selvaraj:

Subject: Energy & Environmental Research Center Proposal in Response to DOE-NETL-EERE-DOT-JOINT-OFFICE-DE-FOA-0002881

This letter is to express North Dakota Department of Commerce's support of the Energy & Environmental Research Center's (EERC) subject proposal being submitted to the U.S. Department of Energy (DOE).

The proposed EERC project will develop and implement a regional Electric Vehicle (EV) infrastructure resilience plan that can assess the current and future threats and risks to regional EV charging infrastructure and provide solutions to ensure the continuity of operations and services of EV infrastructure and maximize benefits to all EV users in North Dakota, South Dakota, Montana, and Minnesota.

Commerce houses the North Dakota State Energy Office and the state energy resiliency plan. Our team is willing to provide resources such as staffing, research, collaboration on community involvement and other time and talent that will help EERC provide this plan for our state. We look forward to working with the EERC team and other project partners if awarded.

Sincerely,

A handwritten signature in black ink, appearing to read "Joshua Teigen", is written over a light blue horizontal line.

Joshua Teigen
Commissioner, North Dakota Department of Commerce

NORTH
Dakota | Emergency Services
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Aug. 17, 2023

Ms. Daisy Selvaraj
Senior Research Engineer
University of North Dakota
Energy & Environmental Research Center
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

Dear Ms. Selvaraj:

Subject: Energy & Environmental Research Center Proposal in Response to DOE-NETL-EERE-DOT-JOINT-OFFICE-DE-FOA-0002881

This letter is to express the N.D. Department of Emergency Services' support of the Energy & Environmental Research Center's (EERC's) subject proposal being submitted to the U.S. Department of Energy (DOE).

The proposed EERC project will develop a regional electric vehicle (EV) infrastructure resilience plan that can assess the current and future threats and risks to regional EV charging infrastructure, provide solutions to ensure the continuity of operations and services of EV infrastructure, and maximize benefits to all EV users in North Dakota, South Dakota, Montana, and Minnesota.

As the central coordinating agency for emergencies and disasters, planning for disruptions to regional EV charging infrastructure is critical for an effective and intentional emergency response. Weather event-wise, North Dakota is a land of extremes. We know we need to consider the impact on our communities should EV infrastructure be impacted during a disaster. If there is a disruption to energy sources for electric vehicles, we would have citizens unable to travel to safety in the event an evacuation is necessary, or they could become stranded during extreme winter weather events. These scenarios must be planned for so we can identify ways to mitigate these impacts.

The N.D. Department of Emergency Services also manages our state's Critical Infrastructure Program, so we understand the importance of strengthening and maintaining a secure, functioning and resilient energy sector. Based on our mutual interests, we are proud to support the proposed project in the form of regular collaboration. The N.D. Department of Emergency Services will participate in the EERC's working group in which we will attend meetings and provide input for resilience and emergency planning. We look forward to working with the EERC team and other project partners if awarded.

Sincerely,



Darin Hanson
N.D. Department of Homeland Security Director



Doug
Burgum
GOVERNOR

Major General
Alan S. Dohrmann
DIRECTOR - DEPARTMENT
OF EMERGENCY SERVICES

Darin
Hanson
DIRECTOR - DIVISION
OF HOMELAND
SECURITY

Darin
Anderson
DIRECTOR - DIVISION
OF STATE RADIO

Ensuring a safe and secure homeland for all North Dakotans



August 2, 2023

Ms. Daisy Selvaraj
Senior Research Engineer
University of North Dakota
Energy & Environmental Research Center
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

Dear Ms. Selvaraj:

Subject: Energy & Environmental Research Center Proposal in Response to DOE-NETL-EERE-DOT-JOINT-OFFICE-DE-FOA-0002881

This letter is to express the Montana Energy Office at the Montana Department of Environmental Quality's support of the Energy & Environmental Research Center's (EERC's) subject proposal being submitted to the U.S. Department of Energy (DOE).

The proposed EERC project will develop and implement a regional electric vehicle (EV) infrastructure resilience plan that can assess the current and future threats and risks to regional EV charging infrastructure, provide solutions to ensure the continuity of operations and services of EV infrastructure, and maximize benefits to all EV users in North Dakota, South Dakota, Montana, and Minnesota.

The Montana Energy Office is committed to initiatives and research that help support resilient and reliable transportation electrification. Based on our mutual interests, we are proud to support the proposed project in the form of in-kind cost share. The Montana Energy Office will provide in-kind contribution in the form of staff time over the period of the project. Our staff contributions will include providing data and information related to electric vehicle charging development and installation and participation in the region-wide resilience working group meetings. We look forward to working with the EERC team and other project partners if awarded.

Sincerely,

A handwritten signature in dark ink, appearing to read "Bijan P. Bini". The signature is fluid and cursive, with a long horizontal stroke extending to the right.



Fargo-Moorhead Metropolitan
Council of Governments

Case Plaza Suite 232 | One 2nd Street N
Fargo, North Dakota 58102-4807
p: 701.532.5100 | f: 701.232.5043
e: metrocog@fmmetrocog.org
www.fmmetrocog.org

July 18, 2023

Dr. Daisy Selvaraj, Senior Research Engineer
Energy & Environmental Research Center
University of North Dakota
15 N 23 Street, Stop 9018
Grand Forks, ND 58202-9018

RE: Energy & Environmental Research Center Proposal in Response to DOE-NETL-EERE-
DOT-JOINT-OFFICE-DE-FOA-0002881

Dear Dr. Selvaraj,

This letter from the Fargo-Moorhead Metropolitan Council of Governments (Metro COG) is to express our support of the Energy & Environmental Research Center's (EERC) subject proposal being submitted to the U.S. Department of Energy (DOE).

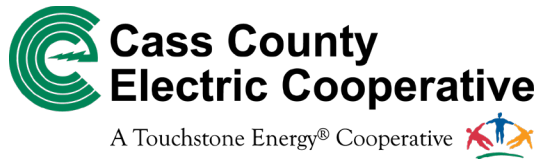
The proposed EERC project will develop and implement a regional Electric Vehicle (EV) infrastructure resilience plan that can assess the current and future threats and risks to regional EV charging infrastructure and provide solutions to ensure the continuity of operations and services of EV infrastructure and maximize benefits to all EV users in North Dakota, South Dakota, Montana, and Minnesota.

Metro COG and area jurisdictions of the Fargo, ND-MN MSA understand the importance of understanding EV feasibility and its benefits within our transportation network, identifying current and potential barriers to EV adoption, and developing infrastructure-related best practices to meet current and future EV needs in our region. We look forward to working with the EERC team and other project partners if awarded.

Sincerely,

A handwritten signature in black ink that reads 'Ben Griffith'.

Ben Griffith, AICP
Executive Director
Fargo-Moorhead Metropolitan Council of Governments



August 2, 2023

Ms. Daisy Selvaraj
Senior Research Engineer
University of North Dakota
Energy & Environmental Research Center
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

Dear Ms. Selvaraj:

Subject: Energy & Environmental Research Center Proposal in Response to DOE-NETL-EERE-DOT-JOINT-OFFICE-DE-FOA-0002881

This letter expresses Cass County Electric Cooperatives' support of the Energy & Environmental Research Center's (EERC's) subject proposal being submitted to the U.S. Department of Energy (DOE).

The proposed EERC project will develop and implement a regional electric vehicle (EV) infrastructure resilience plan that can assess the current and future threats and risks to regional EV charging infrastructure, provide solutions to ensure the continuity of operations and services of EV infrastructure and maximize benefits to all EV users in North Dakota, South Dakota, Montana, and Minnesota.

Cass County Electric Cooperative is an electric cooperative serving over 56,000 members in eastern North Dakota. We will support the proposed project through data sharing where applicable. If awarded, we look forward to working with the EERC team and other project partners.

Sincerely,

A handwritten signature in black ink that reads 'Jodi Bullinger'.

Jodi Bullinger
VP Engineering & Operations



Mountrail - Williams Electric Cooperative

Internet: www.mwec.com
Service Area
Toll Free: 1-800-279-2667

PO Box 1346
Williston, ND 58802-1346
(701) 577-3765

PO Box 129
Stanley, ND 58784-0129
(701) 628-2242

PO Box 59
New Town, ND 58763-0059
(701) 627-3550

August 21, 2023

Ms. Daisy Selvaraj
Senior Research Engineer
University of North Dakota
Energy & Environmental Research Center
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

Dear Ms. Selvaraj:

Subject: Energy & Environmental Research Center Proposal in Response to DOE-NETL-EERE-DOT-JOINT-OFFICE-DE-FOA-0002881

This letter is to express Mountrail Williams Electric Cooperative's (MWEC) support of the Energy & Environmental Research Center's (EERC's) subject proposal being submitted to the U.S. Department of Energy (DOE).

The proposed EERC project will develop and implement a regional electric vehicle (EV) infrastructure resilience plan that can assess the current and future threats and risks to regional EV charging infrastructure, provide solutions to ensure the continuity of operations and services of EV infrastructure, and maximize benefits to all EV users in North Dakota, South Dakota, Montana, and Minnesota.

MWEC's service area covers the north half of the Bakken oil field in Mountrail and Williams counties. MWEC is rapidly growing and just reached 750MW peak load. US Hwy 2 goes through MWEC's service area as well. Based on our mutual interests, we are proud to support the proposed project in the form of assistance with engineering support. MWEC will provide system models, analysis, and engineering input. We look forward to working with the EERC team and other project partners if awarded.

A handwritten signature in blue ink that reads 'Scott Iverson'. The signature is fluid and cursive, with the first name 'Scott' being more prominent than the last name 'Iverson'.

Sincerely,

Scott Iverson
Senior Electrical Engineer
Mountrail-Williams Electric Cooperative





P.O. Box 2747
Fargo, ND 58108

July 28, 2023

Ms. Daisy Selvaraj
Senior Research Engineer
University of North Dakota-Energy & Environmental Research Center
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

Dear Ms. Selvaraj:

Subject: Energy & Environmental Research Center Proposal in Response to DOE-NETL-EERE-DOT-JOINT-OFFICE-DE-FOA-0002881

This letter is to express Xcel Energy's support of the Energy & Environmental Research Center's (EERC's) subject proposal being submitted to the U.S. Department of Energy (DOE).

The proposed EERC project will develop and implement a regional electric vehicle (EV) infrastructure resilience plan that can assess the current and future threats and risks to regional EV charging infrastructure, provide solutions to ensure the continuity of operations and services of EV infrastructure, and maximize benefits to all EV users in North Dakota, South Dakota, Montana, and Minnesota.

Xcel Energy, North Dakota's largest utility began operations in 1908 and is focused on the future of electrification of the transportation industry. Xcel Energy was the first utility to add an electric bucket truck to its fleet. Based on our mutual interests, we are proud to support the proposed project in the form of cost share. Xcel Energy will provide in-kind industry expertise to project working group to develop an EV resilience plan.

We look forward to working with the EERC team and other project partners if awarded

Sincerely,

Tony Grindberg

Tony Grindberg
Xcel Energy
North Dakota Principal Manager
2302 Great Northern Drive
Fargo, ND 58102



August 14, 2023

Ms. Daisy Selvaraj
Senior Research Engineer
University of North Dakota
Energy & Environmental Research Center
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

Dear Ms. Selvaraj:

Subject: Energy & Environmental Research Center Proposal in Response to
DOE-NETL-EERE-DOT-JOINT-OFFICE-DE-FOA-0002881

This letter is to express ZEF Energy's support of the Energy & Environmental Research Center's (EERC's) EV Infrastructure Resiliency Plan proposal being submitted to the U.S. Department of Energy (DOE).

The proposed EERC project will develop and implement a regional electric vehicle (EV) infrastructure resilience plan that can assess the current and future threats and risks to regional EV charging infrastructure, provide solutions to ensure the continuity of operations and services of EV infrastructure, and maximize benefits to all EV users in North Dakota, South Dakota, Montana, and Minnesota. There are considerable grid resources needed to build out all of the EV charging infrastructure needed to support EV drivers traveling in this region. Further, resiliency planning will be key when planning for this infrastructure.

As an EV charging solutions provider (an EVSE manufacturer and network operator), ZEF sees the importance of this work. We specialize in working in rural areas and with mid and small sized utilities and communities. We see the importance of good planning so that investment decisions are well informed, especially with significant funding opportunities coming up over the next 5-7 years. Based on our mutual interests, we are proud to support the proposed project in the form of cost share. ZEF Energy will provide technical input along the way. We look forward to working with the EERC team and other project partners if awarded.

Sincerely,

A handwritten signature in black ink that reads "Megan D. Hoye".

Megan Hoye
Chief Development Officer



August 2, 2023

Ms. Daisy Selvaraj

Senior Research Engineer, University of North Dakota
Energy & Environmental Research Center
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

Subject: Energy & Environmental Research Center Proposal in Response to DOE-NETL-EERE-DOT-JOINT-OFFICE-DE-FOA-0002881

Dear Ms. Selvaraj,

On behalf of Connexus Capital LLC, I submit this letter to express our support of the Energy & Environmental Research Center's ("EERC") subject proposal being submitted to the U.S. Department of Energy ("DOE").

The proposed EERC project will develop and implement a regional Electric Vehicle ("EV") infrastructure resilience plan that can assess the current and future threats and risks to regional EV charging infrastructure and provide solutions to ensure the continuity of operations and services of EV infrastructure and maximize benefits to all EV users in North Dakota, South Dakota, Montana, and Minnesota.

CONNEXUS is a black-owned and operated strategic advisory services firm that specializes in operations and project administration — with a particular focus on infrastructure-level physical & technological initiatives. The company has served clients in renewable energy, law, education, not-for-profit, and financial services. Partners have designed renewable-energy related solutions for nation-state actors, including transportation and energy grid planning programs for the State of California South Coast Air Quality Management District.

Based on our mutual interests, we are proud to support the proposed project in the form of cost-share. CONNEXUS will provide (i) its network, and (ii) the time and expertise of relevant members of its team as needed or otherwise requested to help fulfill project objectives.

We look forward to working with the EERC team and other project partners if awarded. Please feel free to contact me directly at william@connexus.io if I may be of further service.

Most sincerely,



William T. Whitaker
Founder & CEO



August 21, 2023

Ms. Daisy Selvaraj

Senior Research Engineer, University of North Dakota
Energy & Environmental Research Center
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

Subject: Energy & Environmental Research Center Proposal in Response to DOE-NETL-EERE-DOT-JOINT-OFFICE-DE-FOA-0002881

Dear Ms. Selvaraj,

On behalf of SAGE Development Authority ("SAGE"), I submit this letter to express our support of the Energy & Environmental Research Center's ("EERC") subject proposal being submitted to the U.S. Department of Energy ("DOE"). The proposed EERC project will develop and implement a regional Electric Vehicle ("EV") infrastructure resilience plan that can assess the current and future threats and risks to regional EV charging infrastructure and provide solutions to ensure the continuity of operations and services of EV infrastructure and maximize benefits to all EV users in North Dakota, South Dakota, Montana, and Minnesota.

SAGE is a 100% Native-led organization, is dedicated to community development, institution-building, and self-determination for the Standing Rock Sioux Tribe. SAGE Development Authority exists to ensure energy independence, protect the environment, and promote economic growth in the region, for the Tribe. A federally chartered Section 17 Corporation created by the Standing Rock Sioux Tribe, SAGE acts as a Public Power Authority (PPA) that will control and operate all the energy production assets within the reservation. As an organization, SAGE institutionalizes Standing Rock's involvement in renewable energy projects, facilitates agreements with third-party entities, and holds the Standing Rock Sioux Tribe's equity interest.

Based on our mutual interests, we are proud to support the proposed project in the form of cost-share derived from the time and expertise of its team as needed to fulfill project objectives. SAGE will also engage its network as needed in service of the project's fact-finding, research, and solutions development efforts.

We are a committed partner to expanding the use of electric vehicles and charging infrastructure in the region. We look forward to working with the EERC team and other project partners if awarded. Thank you for leading this important project. Please contact me via email at joseph@sagesrst.com, at the office (701-854-4766), or on my cell (701-425-3776) if I may be further of service.

Sincerely,

A handwritten signature in black ink, appearing to read "Joseph McNeil Jr.", written over a horizontal line.

Tatanka Wanjila – Joseph McNeil Jr. | General Manager

SAGE Development Authority



**NATIVE SUN
COMMUNITY
POWER
DEVELOPMENT**

July 31, 2023

Ms. Daisy Selvaraj
Senior Research Engineer
University of North Dakota
Energy & Environmental Research Center
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

Dear Ms. Selvaraj:

Subject: Energy & Environmental Research Center Proposal in Response to DOE-NETL-EERE-DOT-JOINT-OFFICE-DE-FOA-0002881

This letter is to express Native Sun's support of the Energy & Environmental Research Center's (EERC's) subject proposal being submitted to the U.S. Department of Energy (DOE).

The proposed EERC project will develop and implement a regional electric vehicle (EV) infrastructure resilience plan that can assess the current and future threats and risks to regional EV charging infrastructure, provide solutions to ensure the continuity of operations and services of EV infrastructure, and maximize benefits to all EV users in North Dakota, South Dakota, Montana, and Minnesota.

Native Sun is a native-led nonprofit that promotes energy efficiency, renewable energy and an equitable energy transition through education, workforce training and demonstration. We are building a dynamic clean energy future that works for all. Based on our mutual interests, we are proud to support the proposed project in the form of cost share. Native Sun will provide expertise in working with Tribal communities in planning for EV infrastructure. We look forward to working with the EERC team and other project partners if awarded.

Sincerely,

A handwritten signature in black ink that reads "Robert Blake". The signature is written in a cursive, slightly slanted style.

Robert Blake
Executive Director

APPENDIX C
BUDGET NOTES

BUDGET NOTES

ENERGY & ENVIRONMENTAL RESEARCH CENTER (EERC)

BACKGROUND

The EERC is an independently organized multidisciplinary research center within the University of North Dakota (UND). The EERC is funded through federal and nonfederal grants, contracts, and other agreements. Although the EERC is not affiliated with any one academic department, university faculty may participate in a project, depending on the scope of work and expertise required to perform the project.

INTELLECTUAL PROPERTY

The applicable federal intellectual property (IP) regulations will govern any resulting research agreement(s). In the event that IP with the potential to generate revenue to which the EERC is entitled is developed under this project, such IP, including rights, title, interest, and obligations, may be transferred to the EERC Foundation, a separate legal entity.

BUDGET INFORMATION

The proposed work will be done on a cost-reimbursable basis. The distribution of costs between budget categories (labor, travel, supplies, equipment, etc.) and among funding sources of the same scope of work is for planning purposes only. The project manager may incur and allocate allowable project costs among the funding sources for this scope of work in accordance with Office of Management and Budget (OMB) Uniform Guidance 2 CFR 200.

Escalation of labor and EERC recharge center rates is incorporated into the budget when a project's duration extends beyond the university's current fiscal year (July 1 – June 30). Escalation is calculated by prorating an average annual increase over the anticipated life of the project.

The cost of this project is based on a specific start date indicated at the top of the EERC budget. Any delay in the start of this project may result in a budget increase. Budget category descriptions presented below are for informational purposes; some categories may not appear in the budget.

Salaries: Salary estimates are based on the scope of work and prior experience on projects of similar scope. The labor rate used for specifically identified personnel is the current hourly rate for that individual. The labor category rate is the average rate of a personnel group with similar job descriptions. Salary costs incurred are based on direct hourly effort on the project. Faculty who work on this project may be paid an amount over the normal base salary, creating an overload which is subject to limitation in accordance with university policy. As noted in the UND EERC Cost Accounting Standards Board Disclosure Statement, administrative salary and support costs which can be specifically identified to the project are direct-charged and not charged as facilities and administrative (F&A) costs. Costs for general support services such as contracts and IP, accounting, human resources, procurement, and clerical support of these functions are charged as F&A costs.

Fringe Benefits: Fringe benefits consist of two components which are budgeted as a percentage of direct labor. The first component is a fixed percentage approved annually by the UND cognizant audit

agency, the Department of Health and Human Services. This portion of the rate covers vacation, holiday, and sick leave (VSL) and is applied to direct labor for permanent staff eligible for VSL benefits. Only the actual approved rate will be charged to the project. The second component is estimated on the basis of historical data and is charged as actual expenses for items such as health, life, and unemployment insurance; social security; worker's compensation; and UND retirement contributions.

Travel: Travel may include site visits, fieldwork, meetings, and conferences. Travel costs are estimated and paid in accordance with OMB Uniform Guidance 2 CFR 200, Section 474, and UND travel policies, which can be found at <https://campus.und.edu/finance/procurement-and-payment-services/travel/travel.html> (Policies & Procedures, A–Z Policy Index, Travel). Daily meal rates are based on U.S. General Services Administration (GSA) rates unless further limited by UND travel policies; other estimates such as airfare, lodging, ground transportation, and miscellaneous costs are based on a combination of historical costs and current market prices. Miscellaneous travel costs may include parking fees, Internet charges, long-distance phone, copies, faxes, shipping, and postage.

Supplies: Supplies include items and materials that are necessary for the research project and can be directly identified to the project. Supply and material estimates are based on prior experience with similar projects. Examples of supply items are chemicals, gases, glassware, nuts, bolts, piping, data storage, paper, memory, software, toner cartridges, maps, sample containers, minor equipment (value less than \$5000), signage, safety items, subscriptions, books, and reference materials. General purpose office supplies (pencils, pens, paper clips, staples, Post-it notes, etc.) are included in the F&A cost.

Subcontractor – Matthew Stolz: Subcontractors are budgeted based on project needs. Mr. Stolz will handle the technical consulting related to electric utility operation and regulation as it relates to electric vehicle (EV) infrastructure. Cost is based on conversations with vendor for Tasks 1.3/1.4 and 2.3/2.4. Please see the scope of work and background/qualifications for additional details.

Communications: Telephone, cell phone, and fax line charges are included in the F&A cost; however, direct project costs may include line charges at remote locations, long-distance telephone charges, postage, and other data or document transportation costs that can be directly identified to a project. Estimated costs are based on prior experience with similar projects.

Printing and Duplicating: Page rates are established annually by the university's duplicating center. Printing and duplicating costs are allocated to the appropriate funding source. Estimated costs are based on prior experience with similar projects.

Food: Expenditures for hosting listening sessions, focus groups, and engagement trips with community stakeholders where the primary purpose is dissemination of technical information may include the cost of food. EERC employees in attendance will not receive per diem reimbursement for meals that are paid by project funds. The estimated cost is based on the number and location of project partner meetings.

Rents and Leases – Venue Rental: Venue rental for listening sessions, focus groups, and engagement trips with community stakeholders. Two rentals at \$600.

Honorarium: Nominal compensation for stakeholders to participate in listening sessions and focus groups. Based on 10 sessions with four people at \$50 per.

Operating Fees: Operating fees generally include EERC recharge centers, outside laboratories, and freight.

EERC recharge center rates are established annually and approved by the university.

Document production services recharge fees are based on an hourly rate for production of such items as report figures, posters, and/or images for presentations, maps, schematics, website design, brochures, and photographs. The estimated cost is based on prior experience with similar projects.

Technical software fees are for Smartsheet software, which is to be used for tracking and reporting on project specific deliverables and milestones.

Engineering services recharge fees cover specific expenses related to retaining qualified and certified design and engineering personnel. The rate includes training to enhance skill sets and maintain certifications using Webinars and workshops. The rate also includes specialized safety training and related physicals. The estimated cost is based on the number of hours budgeted for this group of individuals.

Facilities and Administrative Cost: The F&A rate proposed herein is approved by the U.S. Department of Health and Human Services and is applied to modified total direct costs (MTDC). MTDC is defined as total direct costs less individual capital expenditures, such as equipment or software costing \$5000 or more with a useful life of greater than 1 year as well as subawards in excess of the first \$25,000 for each award.

APPENDIX D

EERC PROJECTS FUNDED BY NDIC IN THE LAST 5 YEARS

EERC PROJECTS FUNDED BY NDIC IN THE LAST 5 YEARS

Project Name	Start Date	End Date	Total Contracted
Bakken Production Optimization Program 2.0	11/01/16	05/31/20	\$6,000,000
Initial Engineering, Testing, and Design of a Commercial-Scale CO ₂ Capture System	09/01/17	12/31/19	\$3,200,000
FERR 1.3 – Integrated Carbon Capture and Storage for North Dakota Ethanol Production	11/01/17	07/31/18	\$345,000
iPIPE: The intelligent Pipeline Integrity Program	04/01/18	12/31/23	\$2,600,000
Economic Extraction and Recovery of REES and Production of Clean Value-Added Products from Low-Rank Coal Fly Ash	06/16/18	02/15/20	\$30,000
Low-Pressure Electrolytic Ammonia Production	06/16/18	06/30/22	\$437,000
FERR 1.3 – Integrated Carbon Capture and Storage for North Dakota Ethanol Production	12/01/18	05/31/20	\$500,000
State Energy Research Center	07/01/19	06/30/27	\$17,500,000
Underground Storage of Produced Natural Gas – Conceptual Evaluation and Pilot Project(s)	06/01/19	06/30/23	\$3,500,000
Assessment of Bakken and Three Forks Natural Gas Compositions	11/01/19	06/19/20	\$300,650
Improving EOR Performance Through Data Analytics and Next-Generation Controllable Completions	01/27/20	09/30/24	\$500,000
Wastewater Recycling Using a Hygroscopic Cooling System	01/31/20	09/30/22	\$100,000
PCOR Partnership Initiative to Accelerate CCUS Deployment	02/01/20	09/30/24	\$2,000,000
PCOR Partnership Initiative to Accelerate CCUS Deployment	02/01/20	09/30/24	\$2,000,000
FERR 3.2 – Produced Water Management Through Geologic Homogenization, Conditioning, and Reuse	02/01/20	01/31/22	\$300,000
Bakken Production Optimization Program 3.0	05/01/20	04/30/23	\$6,000,000
EERC Technical Support for RTE CCS Activities – November 1, 2019	06/01/20	11/30/21	\$500,000
Flue Gas Characterization and Testing	07/01/20	11/30/21	\$3,741,450
Laboratory-Scale Coal-Derived Graphene Process	09/01/20	04/30/23	\$162,500
Hydrogen Energy Development for North Dakota	07/01/21	06/30/23	\$500,000
Ammonia-Based Energy Storage Technology	04/01/21	03/31/23	\$101,390
Field Study to Determine the Feasibility of Developing Salt Caverns for Hydrocarbon Storage in Western North Dakota	07/01/21	06/30/23	\$11,900,000
Williston Basin CORE-CM Initiative	02/01/22	05/31/23	\$750,000
Front-End Engineering and Design for CO ₂ Capture at Coal Creek Station	02/01/22	08/31/23	\$7,000,000
Unitized Legacy Oil Fields: Prototypes for Revitalizing Conventional Oil Fields in North Dakota	07/01/21	06/30/24	\$3,000,000
iPIPE 2.0: The intelligent Pipeline Integrity Program	01/01/22	12/31/23	\$400,000
Advanced Processing of Coal and Waste Coal to Produce Graphite for Fast-Charging Lithium-Ion Battery	02/01/22	01/31/25	\$500,000
Liberty H ₂ Hub Front-End Engineering and Design	11/01/22	10/31/24	\$10,000,000

Continued . . .

EERC PROJECTS FUNDED BY NDIC IN THE LAST 5 YEARS (continued)

Redundancy Study for CO ₂ Capture at Coal Creek Station	5/26/2023	3/31/2024	\$837,313
Coal Creek Carbon Capture: Geologic CO ₂ Storage Complex Development	7/1/2023	5/31/2024	\$6,119,690
BPOP 4.0 – Bakken Production Optimization Program 4.0	7/28/2023	10/31/2025	\$6,000,000
Prairie Horizon Carbon Management Hub	11/1/2023	10/31/2025	\$100,000
Rare-Earth Minerals Study	2/1/2024	4/30/2025	\$1,500,000

APPENDIX E

REFERENCES

REFERENCES

1. North Dakota Electric Vehicle (EV) Infrastructure Plan: <https://www.dot.nd.gov/construction-and-planning/transportation-plans-programs/north-dakota-electric-vehicle-ev#:~:text=North%20Dakota%20will%20receive%20approximately,charging%20experience%20for%20all%20users> (accessed February 2024).
2. All Hazards Analysis (AHA), A Dynamic Approach to Critical Infrastructure Threats: <https://inl.gov/ics-aha/> (accessed February 2024).
3. Electric Vehicle Charging Station Locations: https://afdc.energy.gov/fuels/electricity_locations.html#/find/nearest?fuel=ELEC (accessed February 2024).
4. U.S. State Population by Rank: <https://www.infoplease.com/us/states/state-population-by-rank> (accessed February 2024).



LIGNITE RESEARCH PROGRAM PROJECT MANAGEMENT REPORT

Reice Haase, Deputy Executive Director, NDIC

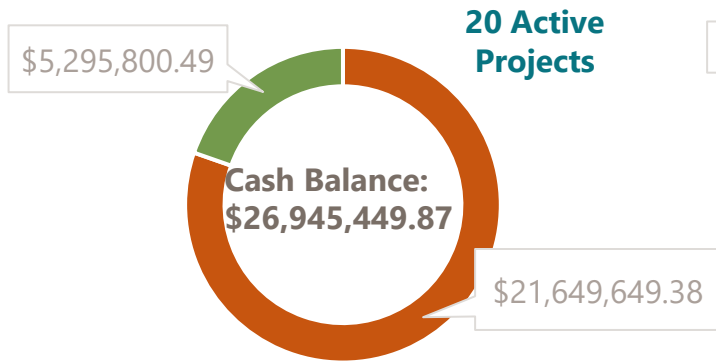
May 28, 2024

NORTH
Dakota

Be Legendary.™

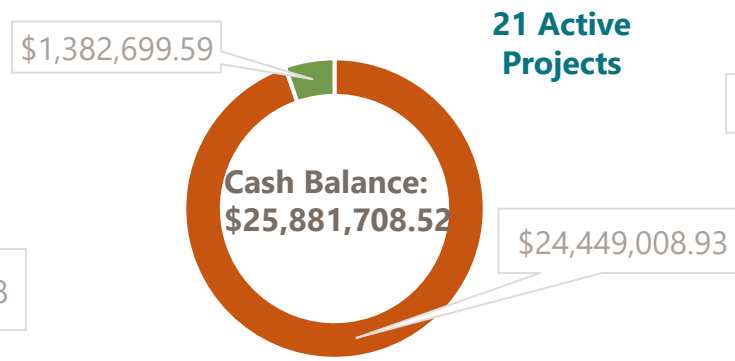
INDUSTRIAL COMMISSION-MANAGED FUNDS

Lignite Research Fund



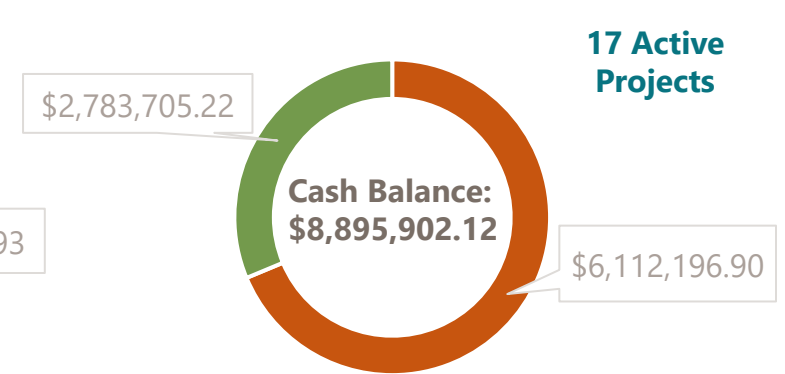
Committed Uncommitted

Oil and Gas Research Fund



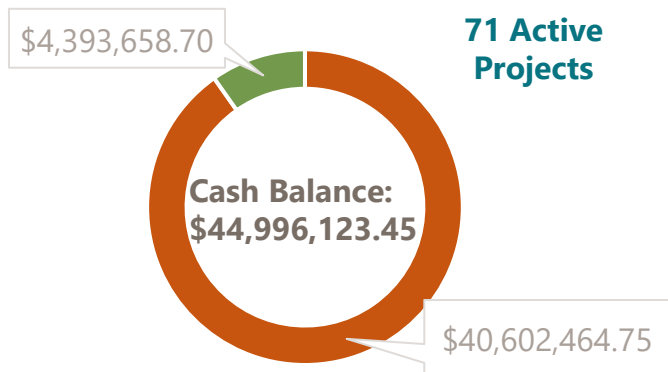
Committed Uncommitted

Renewable Energy Fund



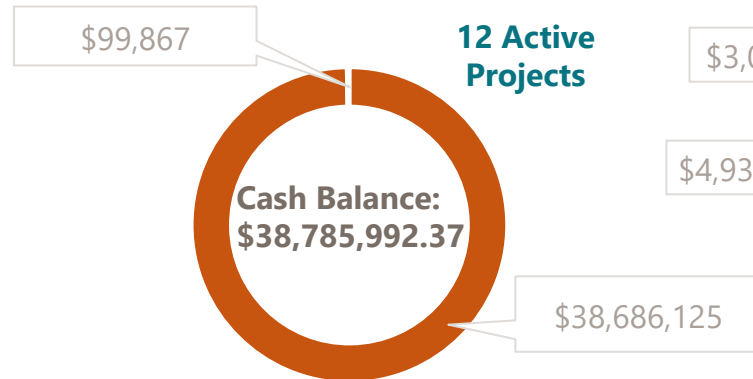
Committed Uncommitted

Outdoor Heritage Fund



Committed Uncommitted

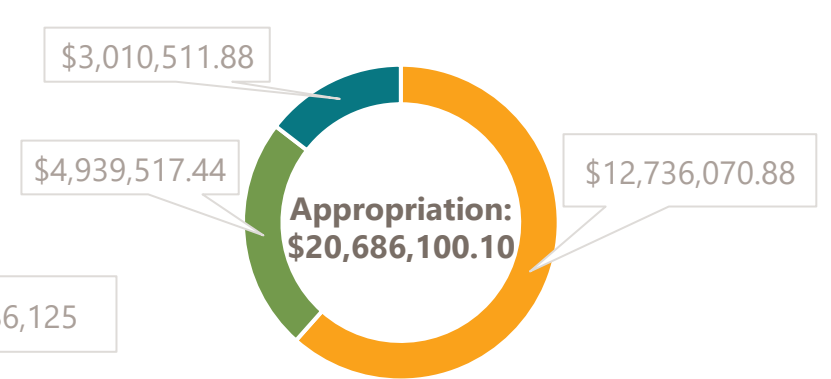
CSEA Fund*



*Does not include ARPA or Loans

Committed Uncommitted

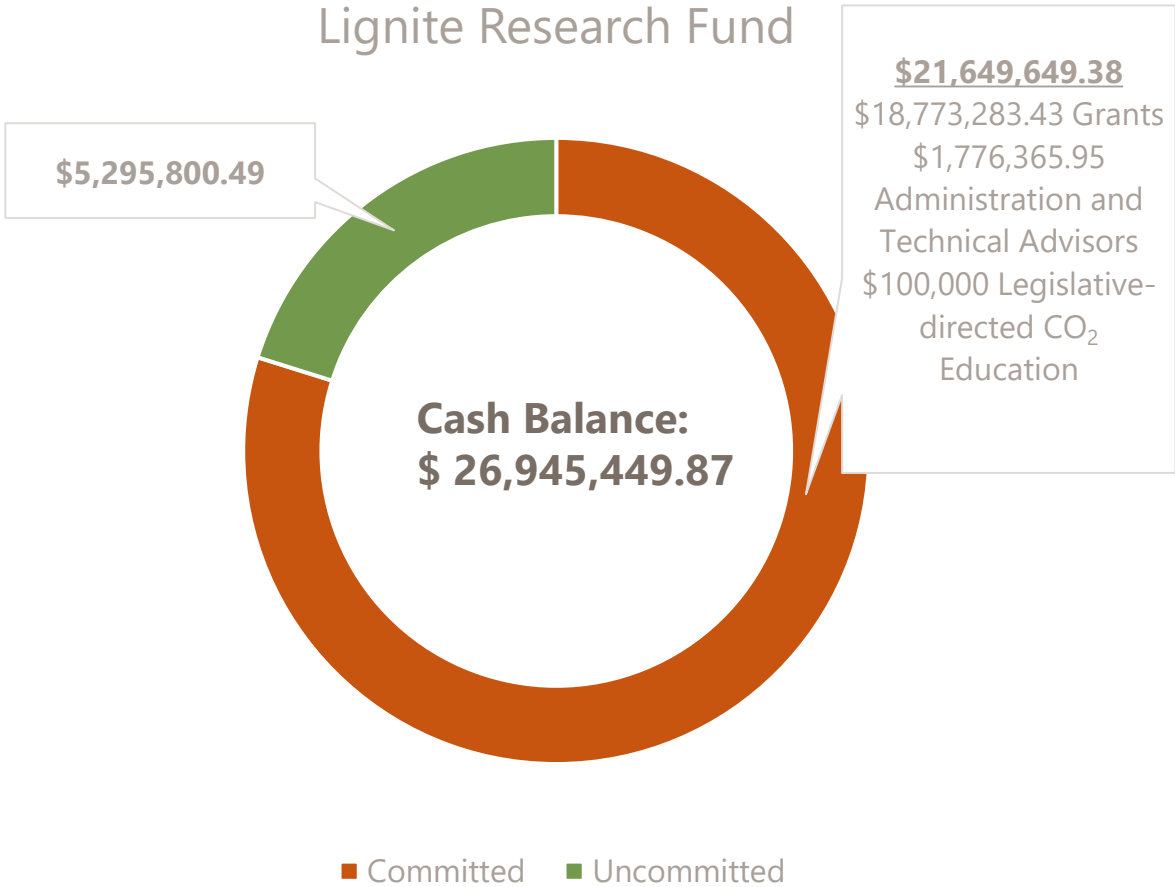
SERC Fund



Leg. Directed Remaining Spent

LIGNITE RESEARCH FUND BALANCE

MAY 9TH, 2024



Funding Source:

- \$8.5 million coal severance and conversion taxes
- \$10 million oil and gas taxes



255 Cumulative Projects



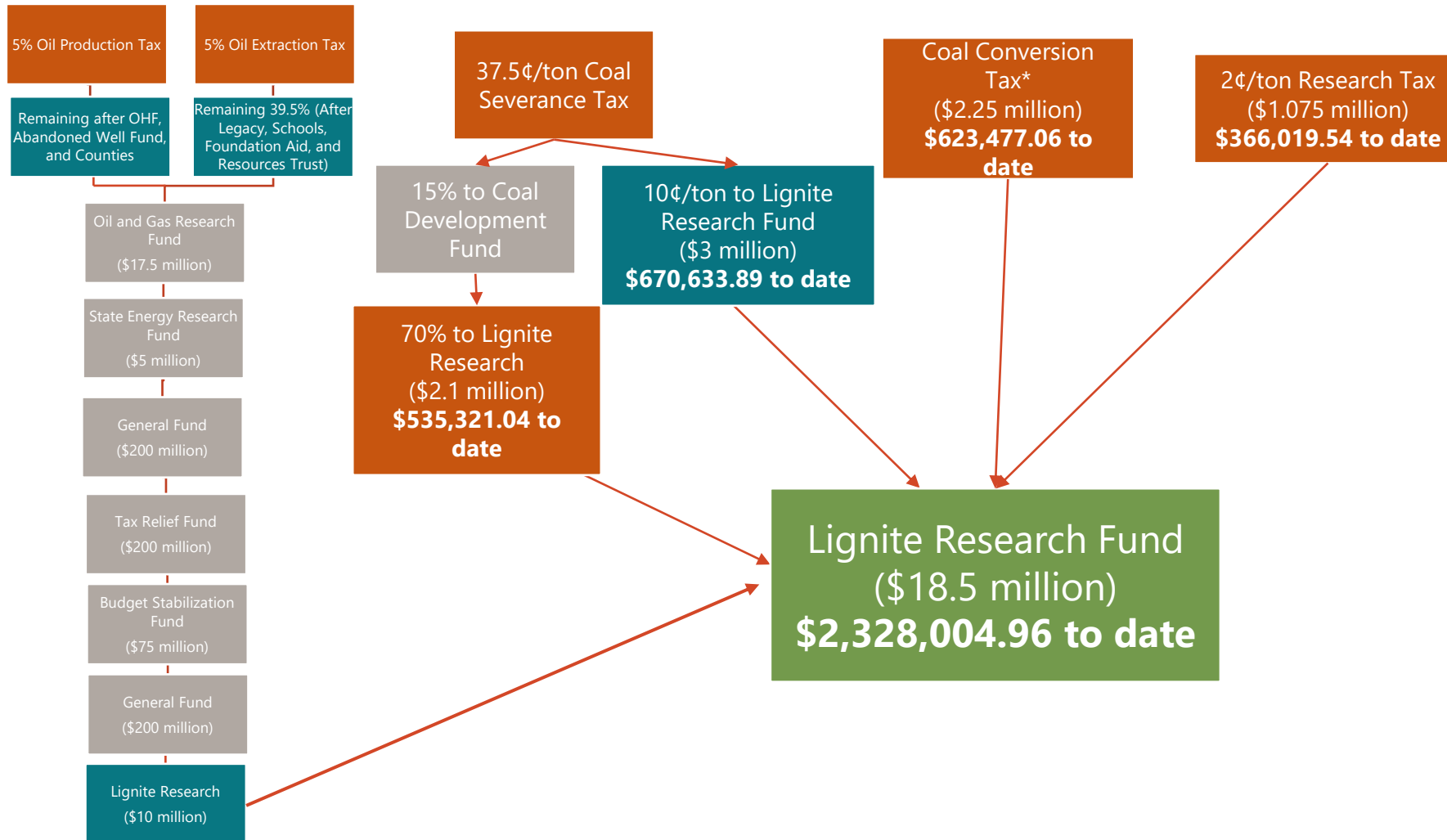
20 Active Projects



Cumulative Value:

- \$172.5 million granted
- \$2.8 billion project value

2023-2025 BIENNIUM APPROPRIATION AND FORECASTED INCOME



Lignite Research Program
Grant Round 104 Applications and Funding Requests (May 2024)

Grant #	Application Title	Principal Investigator	Applicant	Funding Requested	Total Project Costs	Duration	Matching Funds
LRC-104A	Continued Funding for Regional Lignite Public Affairs Program	Kay LaCoe	Lignite Energy Council	\$1,800,000	\$3,600,000	3 years	LEC match \$1,800,000
LRC-104B	Phase I Bridge Study for CCS at Coal Creek Station	Conway Nelson	Rainbow Energy Center	\$1,094,416	\$2,188,833	10 months	\$1,094,417 of cash/in-kind support from Rainbow Energy Center. (\$377,520 in-kind and \$716,897 in cash)
LRC-104C	Lignite Conversion Reactor Optimization for Commercial Carbon Pitch Manufacturing	David A. Berry	AmeriCarbon Products, LLC	\$743,809	\$1,488,809	18 months	\$20,000 in-kind services provided by NACoal, \$725,000 provided as in-kind services from AmeriCarbon.
	FY24 IJJA Grid Resilience Grant Round 2	Claire Vigesaa	ND Transmission Authority	\$582,795	\$4,468,090	12 months	\$3,885,295 in federal IJJA funds from DOE
			Totals:	\$4,221,020	\$11,745,732		

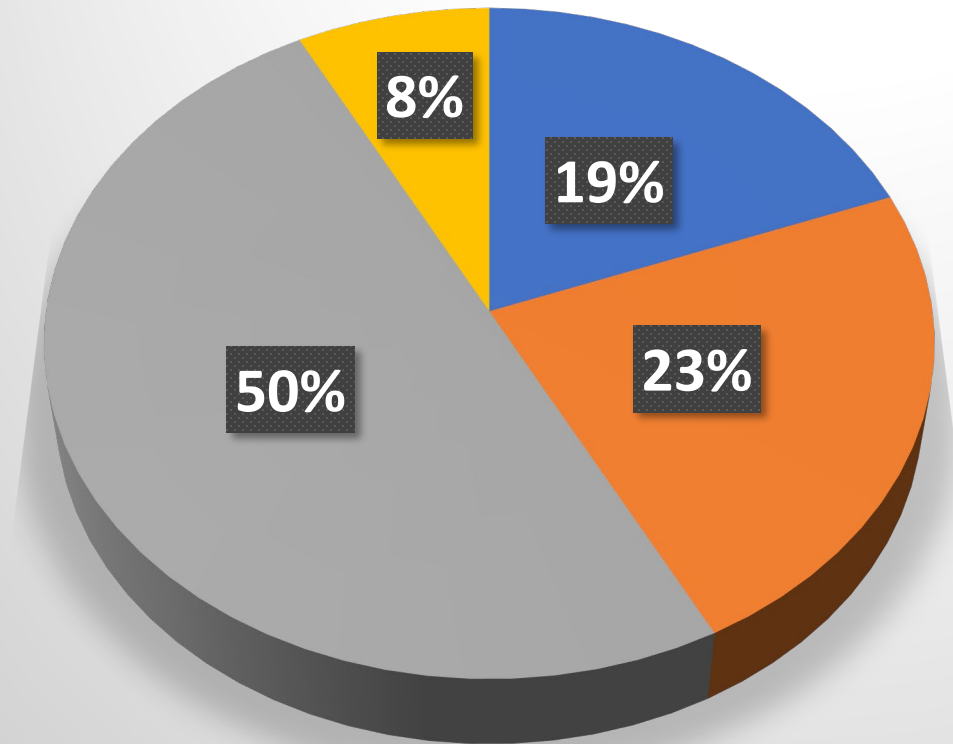
LRC – R&D Update

Lignite Research Program Overview

Mike Holmes

Thursday, May 9, 2024

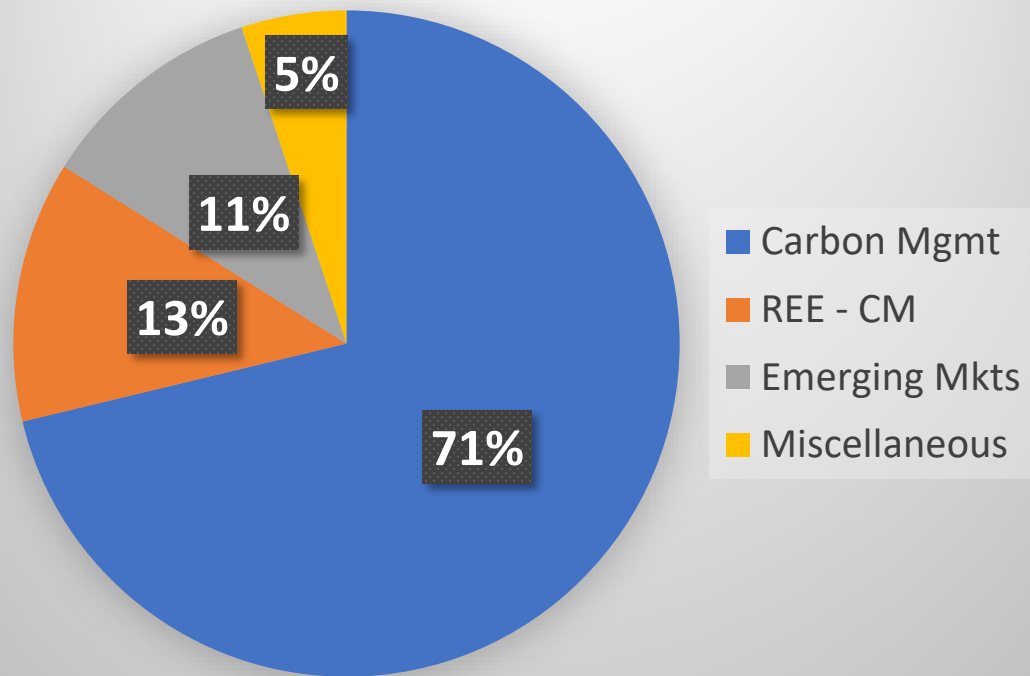
Lignite Research Program – Active Projects



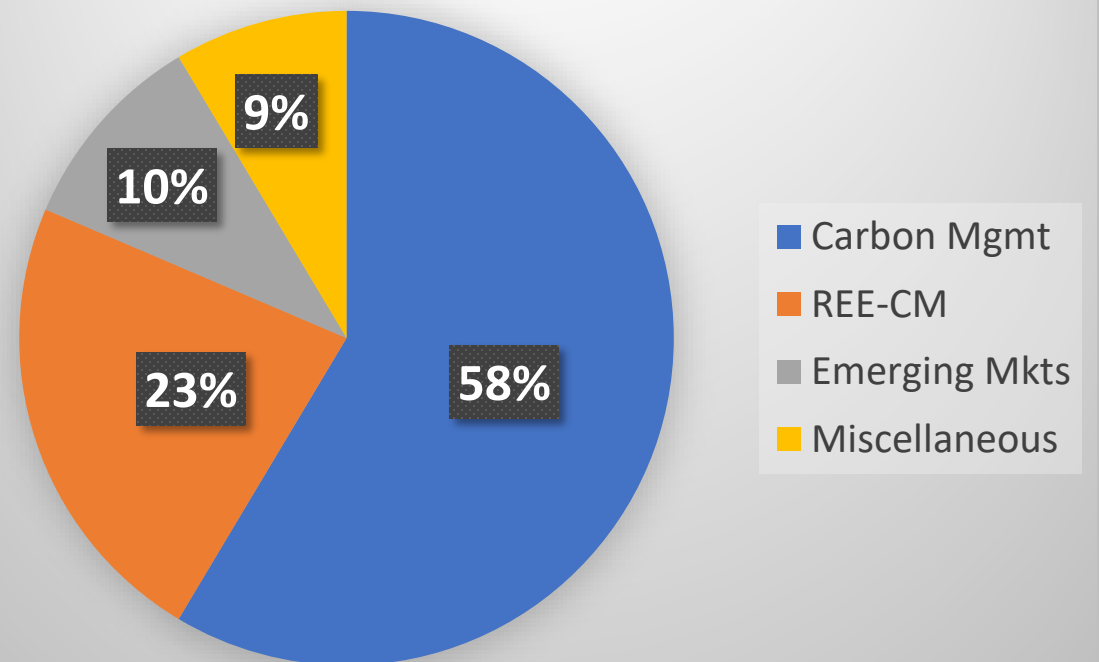
- Carbon Management
- REE - CM
- Other Emerging Markets
- Miscellaneous

Lignite Research Program – Active Projects

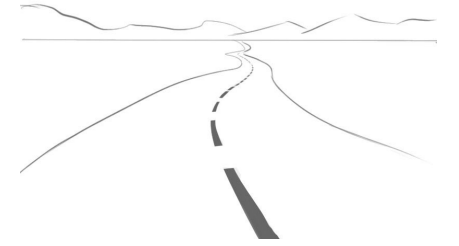
NDIC Funding \$44.4M



Total Project Funding \$161.84M



Lignite Industry Technology Roadmap



Support continued options to enhance performance of the existing fleet



Invest in transformational research (Next generation of Lignite conversion systems that integrate CO₂ capture)



Focus on Carbon Capture Utilization & Storage (CCUS)



Leverage International R&D breakthroughs



Renewed Focus

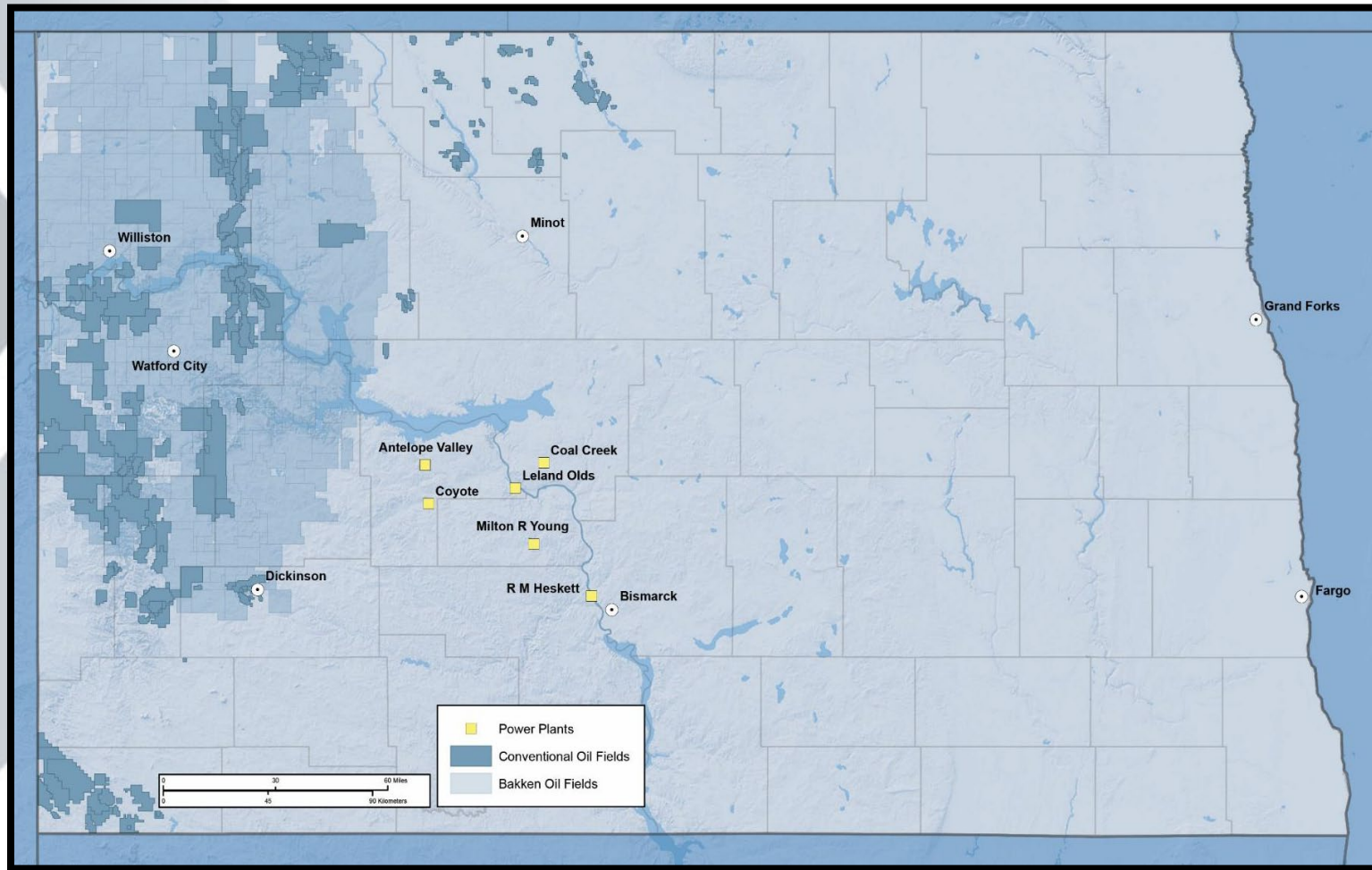
Additional value propositions for lignite
Polygeneration opportunities

Carbon Capture, Utilization and Storage (CCUS)



Graphic from EERC PCOR Program

Unlocking the Full Potential of Conventional EOR in North Dakota



Identified

201

Conventional Oil Fields

Requiring

358,000,000

Tons of CO₂

To Produce Up to

1,000,000,000

Barrels of Incremental Oil

Bakken CO₂ Demand for North Dakota – A 30,000-ft View

- Based on the following:
 - Traditional evaluation techniques
 - NDIC OOIP estimates
 - 4% incremental recovery
 - Net utilization of 5000 and 8000 ft³/bbl
- 2–3.2 Bt of CO₂ needed, yielding 4–7 Bbbl of oil.
- North Dakota currently produces ~33 Mtpy of CO₂.



Lignite Research Program Carbon Management Projects



PCOR Initiative to Accelerate CCUS Deployment

This project provides a continuation of the PCOR program to help address challenges and opportunities for commercial CCUS in the region.

Lead: Kevin Connors, EERC (UND)



Project Tundra

Front End Engineering and Design (FEED) study for carbon capture utilization and storage at the Milton R. Young Station.

Lead: Gerry Pfau, Minnkota Power



Project Tundra CREST Study

Construction readiness evaluation that also includes evaluation of opportunities to improve the process economics and operation.

Lead: Craig Bleth, Minnkota Power



Preliminary Front-End Engineering and Design (pre-FEED)

Study for a full-scale carbon dioxide capture system at Coal Creek Station (CCS2) – Initial investigation of the potential for CCUS at Coal Creek through a pre-FEED study and includes investigation of the storage geology.

Lead: John Bauer, Rainbow Energy – Completed

Both completed in 2023 including the associated Carbon SAFE storage evaluation.

The FEED study is ongoing under the CSEA Program

Lignite Research Program

Carbon Management Projects (Cont'd)



- **Redundancy Study for CO2 Capture at Coal Creek Station** – The EERC in collaboration with Rainbow Energy Center will evaluate equipment redundancy needs for carbon capture at the Coal Creek Station. The project is in support of the front-end engineering design study for the capture plant by reducing operational risks for supplying baseload power with high reliability and availability.
- Lead: Jason Laumb, EERC



- **Coal Creek Carbon Capture Geologic CO2 Storage Complex** – The EERC in partnership with Rainbow Energy Center will advance development of a geologic carbon dioxide storage complex in central North Dakota to store carbon from the Coal Creek Station. The objective is to fully characterize and permit the geologic storage complex.
- Lead: Amanda Livers-Douglas, UND Energy & EERC

Lignite Research Program Building Materials Projects

Semplastics EHC LLC



Artist's conception of coal building proof-of-concept design by CART

Systematically Applied Research to Develop High Value Products from Coal – Development of new improved building materials out of lignite-based resources.

Lead: Bill Easter, Semplastics

Completed Q1 2024

Incorporation of Coal and Coal Waste Into High-Value Materials – Follow-on of Semplastics project for development of new improved building materials out of lignite-based resources. Leading toward a demonstration structure.

Lead: Bill Easter, Semplastics

Development of Novel Sintered Coal Building Materials – Microbeam Technologies Incorporated (MTI) approach to making building materials from coal Feedstocks.

Lead: Matt Fuka, MTI

Final Report in preparation

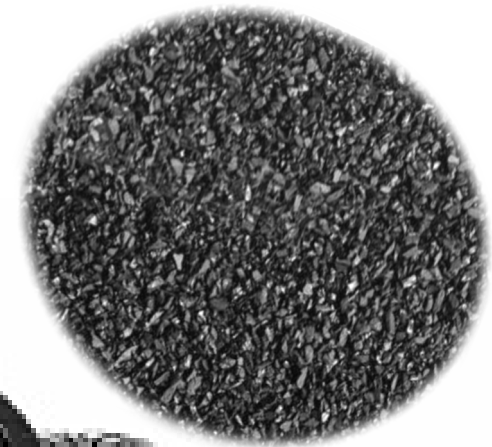
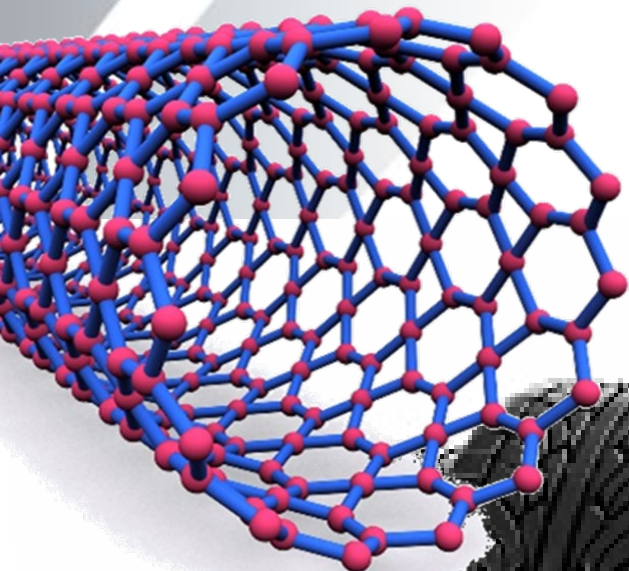
Lignite Research Program Carbon Materials

Laboratory-Scale Coal-Derived Graphene Process – Development of a technological process for converting North Dakota Lignite into high-value solid carbon products such as graphene. Lead: Alexander Azenkeng, EERC (UND) – Completed 2023

Advanced Processing of Coal and Coal Waste to Produce Graphite for Fast-Charging Lithium-Ion Batteries – Follow on EERC project, Alexander Azenkeng.

Lignite Derived Carbon Materials for Lithium-Ion Battery Anodes – Develop and demonstrate an economic process for production of advanced composite anode materials for lithium-ion batteries using lignite. Lead: Xiaodong Hou, UND Institute for Energy Studies

ND Lignite Coal-Based Pitch for Production of High Value Carbon Products – Use of Lignite to produce coal pitch for use in carbon materials such as graphene, asphalt, tires, ... Lead: David Berry, AmeriCarbon Products, LLC.
ND FEED study Added

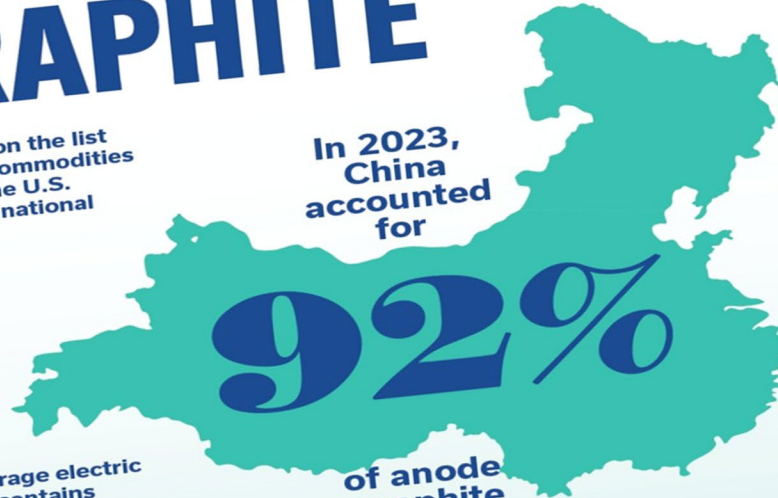


THE CRUCIAL NEED FOR GRAPHITE



Graphite is on the list of mineral commodities critical to the U.S. economy & national security

In 2023, China accounted for



The average electric vehicle contains **175lbs.** of processed graphite

of anode graphite production globally
Reference: Benchmark Materials

4 

operational U.S. lithium-ion battery plants (21 more in development)

REQUIRE

1.2
Million TONS
of spherical graphite every year
Reference: Google



Read More
caer.uky.edu



918,500
Plug-In, electric light vehicles produced in the United States in 2022

\$73B

In planned battery projects announced in 2023—each needs graphite supply
Reference: NPR



LRC-104A

Title: “Continued Funding for Regional Lignite Public Affairs Program”

Submitted By: Lignite Energy Council

PM/PI: Jason Bohrer / Kay LaCoe

Duration: 3 years

Purpose:

The purpose of this grant is to strengthen the reputation and awareness of coal-based electricity. This proposal is for three years. The project will use strategic communication, data-driven campaigns, educational outreach, and lignite-based market development. The goal is to maintain public favor of coal-based electricity. Efforts are needed to showcase reliability, economic importance, and tech advancements of the coal industry. The strategy involves targeted awareness campaigns to educate the community and policymakers about energy challenges, solutions, and the vital role of coal-based electricity. The project will disseminate messages to promote the goals and merits of the lignite industry through media visits, chamber events, news releases, and social media. Focus on developing and enhancing educational and marketing initiatives that promote the benefits and affordability of coal-based electricity. This will help maintain lignite electricity's status as a cornerstone of the regional energy supply.

Funding: NDIC: \$1,800,000; Total Project Costs: \$3,600,000

Recommendation:

Fund –The two reviewers recommended funding. The proposal received an average score of 207 out of 250.

Funding would be subject to: Semi-annual reporting be provided to the Industrial Commission

Conflicts of Interest: Lignite Energy Council and members of the Lignite Energy Council.

Reviewers: Fund - 2; Consider Funding - 0; Do Not Fund – 0

LRC: Fund: Yes - 13; No – 1; Abstain - 0



April 1, 2024

Reice Haase
Deputy Executive Director
North Dakota Industrial Commission
Attn: Lignite Research Program
600 East Boulevard Avenue
Bismarck, ND 58505

Subject: Grant Application Submittal: “Continued Funding for Regional Lignite Public Affairs Program”

Dear Reice:

The Lignite Energy Council, a regional trade association of producer, utility, and business members who produce approximately 28 million tons of lignite and generate electricity from lignite that serves two million people in the Upper Midwest region, is pleased to submit the enclosed proposal to seek continued funding for the Regional Lignite Public Affairs Program.

Members of the Council will provide the matching funds for this project.

Also, enclosed is a \$100 check for the grant application fee.

Thank you for the opportunity to submit this proposal.

Sincerely,

LIGNITE ENERGY COUNCIL

Jason W. Bohrer
President and CEO

Enclosures: \$100 application check

Continued Funding for Regional Lignite Public Affairs Program

Submitted by
Lignite Energy Council

Principal Investigator
Lignite Energy Council

April 1, 2024

Amount Requested: \$600,000 Annually for Three Years for a Total of \$1.8 million

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Implementation of Regional Lignite Public Affairs Program

ABSTRACT

Due to the continued success of the Regional Public Affairs Program (Program), the Lignite Energy Council is advocating for the continuation of the Program. As a testament to our commitment, we are submitting a comprehensive three-year proposal:

Objective:

To sustain and enhance public perception and stakeholder knowledge regarding the importance of coal-based electricity in the State of North Dakota and the surrounding region, promote its benefits, and drive adoption and investment in emerging markets and value-added initiatives derived from the lignite industry.

Expected Results:

- Development and execution of an integrated marketing and communications plan to educate the public about the North Dakota coal industry.
- Maintain strong favorability ratings of 66% or more in support of coal-based electricity in the State of North Dakota.
- Promote and educate the public and policymakers about emerging markets and value-added products from North Dakota lignite.
- Increase engagement in educational and marketing campaigns about the benefits and impacts of the North Dakota coal and electricity production industries.

Duration:

The Regional Lignite Public Affairs Program is expected to be long-term to achieve the desired objectives. Therefore, this application is for three years and is expected to be Phase X of a long-term plan. This plan began in October 1996 with phase I. Subsequent phases occur every three years. With its proven track record, the Regional Lignite Public Affairs Program is geared to begin Phase X of this critical initiative on January 1, 2025.

Total Project Costs:

The total budget for implementing the Regional Lignite Public Affairs Program is \$3.6 million over three years. This request from the Industrial Commission of North Dakota is for \$600,000 annually spread over three years, which will be matched by industry. Matching funds are secured via Lignite Energy Council membership dues.

Participants:

The Lignite Energy Council, in collaboration with advisory boards and industry stakeholders, will oversee the implementation and evaluation of the program.

PROJECT SUMMARY

This project, undertaken by the Lignite Energy Council (LEC) and advisory boards, aims to strengthen the reputation, perception, and awareness of coal-based electricity as well as demonstrate its importance to the State of North Dakota and the region over a three-year period. The objectives outlined in this project are grounded in strategic communication, data-driven awareness campaigns, educational outreach, and the development and promotion of emerging lignite-based markets.

The project's first objective is to maintain the public favorability ratings of coal-based electricity over the next three years. This will require consistent efforts to showcase the reliability, economic importance, and technological advancements within the coal industry to continue to maintain and move public opinion in a positive direction.

A key component of the strategy involves continuing our targeted awareness campaigns to reach a significant portion of the state's population and policymakers. This objective will boost the community's and policymakers' understanding of energy challenges, solutions, and the integral role coal-based electricity plays in the regional energy mix.

To guide this public awareness initiative, the project will focus on disseminating carefully crafted message priorities that articulate the lignite industry's goals and merits. Media relations activities include media visits, chamber events, news releases, social media, etc.

An ongoing effort will be made to develop and enhance educational and marketing initiatives that exhibit the advantages and cost-effectiveness of coal-based electricity. This focus ensures that the value of lignite electricity continues to be communicated effectively to consumers, supporting its status as a cornerstone of the regional energy supply.

Fulfilling these objectives, the project aims to maintain and build upon coal-based electricity's vital contribution to the State of North Dakota, advocating for its sustained use and advancement well into the future.

PROJECT DESCRIPTION

The Lignite Energy Council and the Minnesota-focused Coalition for a Secure Energy Future serve as pivotal networks for the numerous individuals, businesses, officials, and groups in North Dakota and Minnesota who champion coal-derived electricity. Our organization offers a platform to unite and align with the State of North Dakota alongside common goals, ensuring effective education for the public and policymakers about the continued use of coal power.

The governance of the public affairs program is rigorously overseen and guided by a committee of representatives from the major member companies of the Lignite Energy Council (LEC) and technical advisement from the Lignite Research Council. The State Public Affairs Committee convenes as required to analyze public opinion polling, strategize, and devise tactics, all of which are executed by the dedicated Lignite Energy Council staff and contractors.

The Lignite Energy Council State Public Affairs Committee is tasked with developing and approving an integrated marketing and communications plan focused on public affairs and

strategic communications efforts. These efforts complement each other to support favorable political and regulatory outcomes regionally and nationally.

The Committee met in late November 2023 to begin developing a strategy for 2024 and 2025. One outcome of that meeting was a Messaging and Audience Priorities survey of the Committee members and members of the Lignite Energy Council Management Committee. The results of the survey were used to identify the following topics designated as the two main issues for the Regional Public Affairs Program to prioritize messaging and campaigns for 2024 and 2025:

- Regulatory “Trainwreck”
- Coal and Carbon Capture

The survey results also helped identify and prioritize topic and issue areas of advocacy and communications support that the State Public Affairs Committee, Lignite Energy Council Management Committee, and other stakeholders continue to value. While these areas and issues may not be the primary focus of public affairs campaigns in 2024, they do represent the major messaging components and educational efforts that support the mission of the Lignite Energy Council and the deliverables outlined in the Grant. These areas should be viewed as day-to-day functions and initiatives for the Council.

- Industry Education: North Dakota’s role in the regional energy mix including the grid reliability crisis
- Industry Education: Lignite’s value as a baseload power source and how it’s used
- Industry Education: Economic importance and impact of the lignite industry in North Dakota
- Additional general education about the fuel source, process, and industry

While this three-year proposal primarily addresses present strategies, the Lignite Energy Council emphasizes the need for adaptability in identifying future strategies, recognizing the dynamic nature of the coal-based electric industry, and the necessity for flexible approaches to meet evolving challenges and opportunities. For instance, while we will continue to promote the successes of the Lignite Research and Development program, we have only recently started a more aggressive promotion of carbon capture technology for the coal industry, such as carbon capture infrastructure and education about the science. It would not have made sense even a few years ago to be out in front of regional utilities in promoting carbon capture for coal before projects were announced, approved, or received funding. Our efforts in this area have served as a springboard and the most substantive building block for the recently approved Carbon Dioxide Education and Marketing grant that was approved by the North Dakota Industrial Commission and funded by the three state research councils.

The program’s directives aim to broaden awareness and support of coal-based electricity throughout the region. This involves educating legislators and other elected and appointed officials to increase their understanding of coal’s significance to families and businesses. Additionally, it includes meeting with like-minded associations and allies to support policies that keep coal-based electricity as a valuable component of the regional energy mix. It also entails using diverse communication channels to alert interested parties about the Program and

activities, along with proactively messaging about an “all-of-the-above” energy policy that includes and relies on coal-based electricity.

The public affairs committee, working closely with our consultants and staff, ensures seamless alignment of our promotional activities. We are committed to improving our strategies to effectively connect in this ever-changing environment. Despite the ever-changing landscape, certain core activities, such as audio and visual media promotion, earned media placements, and strategic paid media investments, will persist as foundational elements that anchor our commitment to communication. With the historic 10-year mark of the current Program and the 29th year of the State’s investment in a regional lignite marketing program, LEC will be conducting thorough evaluations of our contracts with current consultants, ensuring that they are still the best fit for our mission and objectives.

The staff of the Lignite Energy Council and our contractors collaborate closely with fossil fuel advocates, state and national trade groups, global research organizations, the Department of Energy, and academic institutions to deliver timely and accurate messages. We actively partner with the Energy & Environmental Research Center on educational initiatives and engage with both local and statewide chambers of commerce to champion coal-based electricity.

Weekly Lignite Line newsletters and quarterly Coal Suite webinars exemplify our strategy of creating communication tools for our primary audience (members) and repurposing them for secondary audiences. Lignite Line and Coal Suite highlight specific subjects we want our members to share with their friends and family, reinforcing their role as recognized experts in the energy industry. After distributing the information internally, we further amplify the content approved for public consumption by sharing it on social media platforms and with the media.

We will employ a range of media to reach diverse audiences, including policymakers, members, and the general public. Our communication channels include news releases, op-eds, advertising, websites, media relations, social media updates, grassroots outreach, and in-person meetings, all aimed at presenting a cohesive and strong endorsement of lignite-based electricity.

STANDARDS OF SUCCESS

Public affairs strategies and activities are frequently oriented toward the long term, which makes calendar-based goal setting and evaluation difficult. Assessing the effectiveness of many public affairs strategies proves challenging due to their non-transactional nature and often revolves around engaging stakeholders and building alliances. Additionally, objectives may shift during the year, particularly when navigating external entities, regulations, or legislative bodies – what may be an emergent scenario in January could change or be replaced with something else by July. The following metrics serve as key indicators to gauge the effectiveness of our public affairs efforts. These will be continually updated with benchmarks and current figures throughout the year. *Some metrics may be excluded based on the campaign's evolving needs:*

- Social media interaction and engagement
- Comprehensive media coverage
- Media sentiment and tone analysis (positive, negative, neutral)

- Email open rate
- Potential reach across viewership and publication distribution
- Website visitor traffic and analytics
- Advertising impressions and market penetration
- Further engagement metrics: letters of support/editorials, testimonies, and endorsements

BACKGROUND

The Lignite Energy Public Affairs Program was first formed in 1996 to improve the overall public image of coal-based electricity and to promote its use as a low-cost, reliable, and environmentally sustainable energy source for the region. Public opinion polls in North Dakota show that attitudes toward coal-based electricity have improved significantly due to the sustained effort to promote the industry. In a 2023 poll, 72 percent of North Dakotans supported or strongly supported the use of coal to generate electricity.

North Dakota's lignite industry is a cornerstone of the state's economy, ranking as the fifth-largest industry statewide. It generates an impressive 12,000 primary and secondary jobs. The industry's economic impact resonates deeply, contributing a staggering \$5.75 billion annually in economic activity and a substantial \$104 million in local and state tax revenue each year.

The industry not only offers some of the highest-paying jobs in the state but also boasts an average annual wage of \$90,000 - \$120,000 for coal miners or power plant operators.

The lignite industry's success during the 2021 Legislative session highlights the effectiveness of the \$3.6 million invested over the past three years. This investment has maintained the industry's favorability ranking among the highest in the nation and established a solid foundation of support among North Dakota policymakers. As a result, the state has benefited from \$100 million in tax relief and has allocated millions more for research and development projects.

QUALIFICATIONS

The Lignite Energy Council will be responsible for managing the Regional Lignite Energy Public Affairs Program.

Lignite Energy Council: The Lignite Energy Council is a regional trade association with the following mission statement "The Lignite Energy Council shall protect, maintain, and enhance development of our region's abundant lignite resource." LEC conducts programs in four separate areas including: government action; research, development and marketing; education; and public relations. Through these programs, the Council seeks to maintain a viable lignite industry and enhance development of North Dakota's abundant lignite resources in a clean, economical and efficient manner. These programs provide timely, accurate information that enables elected officials, government leaders and the public to make sound, informed decisions on lignite issues.

The principal LEC employees involved in this program include:

- **Jason Bohrer** - president & chief executive officer of the Lignite Energy Council. Jason is a graduate of North Dakota State University and earned his law degree from George Mason University. He was a member of the National Coal Council and serves on the North Dakota Empower Commission. Prior to joining the Lignite Energy Council, Bohrer worked nine years in Washington, D.C. During his career, Jason has worked on energy policy initiatives related to coal mining and energy development, as well as nuclear energy and waste disposal, oil and gas exploration, energy tax credits, hydropower relicensing, and biomass and other renewable energy projects. Jason has drafted legislation to facilitate the expansion of the nation’s transmission infrastructure and improve cybersecurity protocols. He was named to his current position in 2013 and has worked to expand its R&D capabilities, public affairs, and legislative programs.
- **Kay LaCoe** has worked for the Lignite Energy Council since 2008 and is currently the vice president - marketing & communications. Kay LaCoe is a graduate of the University of Mary with a bachelor’s of science degree in business communications and a master’s degree in organizational leadership. Kay’s background includes writing, public affairs, website development, graphic design, integrated marketing, and social media management. Prior to joining the Lignite Council in 2008, Kay spent the early part of her career at Basin Electric and Agency MABU working in the communications, marketing, and project management fields.

Public Affairs Company: The Public Affairs Company is based in Minneapolis, MN, and provides an integrated, bipartisan approach to public affairs. It incorporates communications and public relations counsel to help clients successfully execute successful public policy campaigns. The Public Affairs Company coordinates all advertising buys for the Coalition in Minnesota and North Dakota.

- **Luke Hellier** worked in government and politics prior to joining the Public Affairs Company. Luke brings a wide range of expertise in communications, political campaigns, community outreach and news media. Luke earned his degree in political science from St. John’s University in Collegeville, Minn.

KAT Marketing, a full-service marketing agency, founded in 1989 by its current owner and CEO, Todd Muggerud. KAT is based in Bismarck, ND, and offers a full spectrum of marketing and advertising services. KAT Marketing assists with Podcasts, a time-lapse photo project at BNI Coal’s Center Mine and the NextGen ND program.

D&N Cinematics, a full-service video production house based in Bismarck, North Dakota, creates and produces TV commercials, web-based content, drone-based aerial footage, grip truck rental and video editing. This group produced the 30-minute coal movie and the “I Am Lignite” campaign in 2020.

VALUE TO NORTH DAKOTA

The lignite energy industry is crucial to North Dakota's economic resiliency. Since 1988, lignite production has consistently averaged just less than 30 million tons annually, positioning North Dakota as the nation's top producer of lignite coal and just outside the top five coal-producing states in the nation. While the primary economic activity occurs in the three counties of Mercer, McLean and Oliver, the entire state of North Dakota benefits from the industry through jobs, taxes, and affordable and reliable electricity.

This Regional Public Affairs Program will assist in:

- Preserving and creating jobs involved in the production and utilization of North Dakota lignite;
- Ensuring economic stability, growth and opportunity in the lignite industry; and
- Supporting the lignite industry's significant contribution to North Dakota's tax base, generating substantial tax revenue that promotes prosperity throughout the state.

These efforts contribute to the increasing significance of lignite energy, as outlined in the North Dakota Century Code 54-17.5.01.

MANAGEMENT

The project will be managed on a day-to-day basis by Kay LaCoe, Vice President of Marketing and Communications of the Lignite Energy Council, with oversight from Jason Bohrer, President and CEO of the Lignite Energy Council, with assistance from industry through the State Public Affairs Committee of the Lignite Energy Council (Exhibit 1).

TIMETABLE

The implementation of the Lignite Regional Public Affairs Program is expected to be long-term to achieve the desired objectives. However, this application is for three years and is expected to be Phase X of a long-term plan. Phase X will be implemented starting January 1, 2025, and conclude December 31, 2027.

A thorough evaluation of all objectives will occur during the fourth quarter of each grant year to measure progress and inform the planning for future actions ensuring alignment with current industry goals and political objectives.

BUDGET

The total budget for the implementation of the Regional Lignite Energy Marketing Plan is \$3.6 million over three years. Refer to Exhibit 2 for an itemized list of revenue and expenditures for this project. No equipment or additional facilities are needed to implement this budget. If the funding from the Lignite Research Council falls short of the requested amount, the achievement of our objectives will be significantly delayed.

MATCHING FUNDS

The Lignite Energy Council's approximately 250 members pay annual dues, enabling LEC to secure \$600,000 in cash match funds annually for three years. This matches the Industrial Commission's funding of \$600,000 annually over the same period.

CONFIDENTIAL INFORMATION

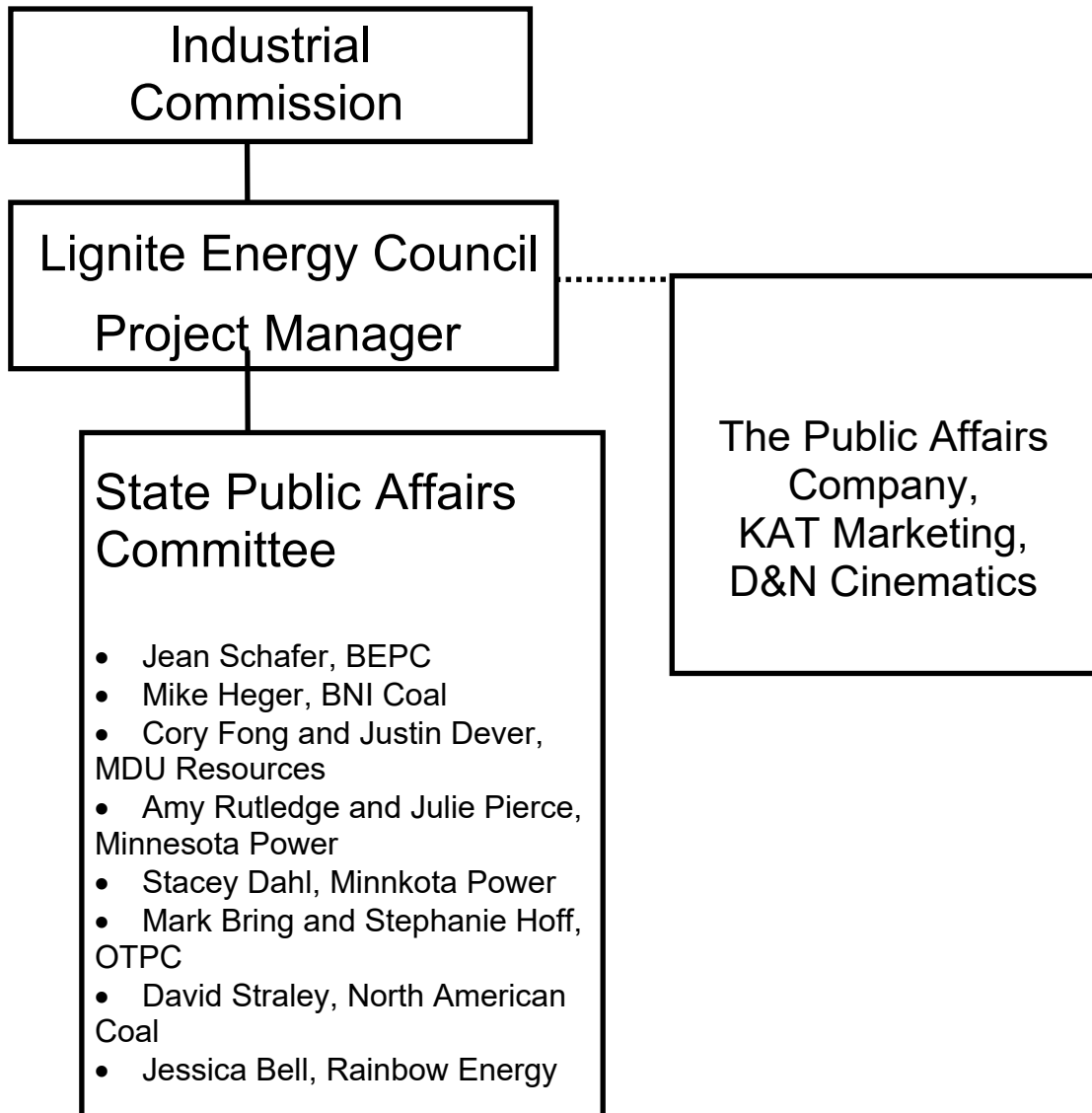
The applicant requests confidentiality pursuant to Section 54-17.5-06 of the North Dakota Century Code.

TAX LIABILITY

I, Jason Bohrer, certify that the Lignite Energy Council is not delinquent on any tax liability owed to the State of North Dakota.

Jason Bohrer, President
Lignite Energy Council

Management of North Dakota Lignite Energy Marketing Plan



North Dakota Lignite Energy Marketing Plan Budget

Proposed Annual Revenue			
		Annual Project Budget	
North Dakota Industrial Commission	\$600,000		
Industry Stakeholder Commitments	\$600,000		
Total Annual Revenue	\$1,200,000		
Proposed Annual Expenditures			
Project Costs		Annual Project Budget	
		NDIC	Stakeholders
Advertising (North Dakota & Minnesota)	304,500	152,250	152,250
Salaries/Benefits/Management Fees	425,504	212,752	212,752
Professional Services	215,000	107,500	107,500
Special Projects	50,000	25,000	25,000
General (office expenses, travel, meetings)	104,996	52,498	52,498
Education/Outreach	100,000	50,000	50,000
Total Annual Expenditures	\$1,200,000	\$600,000	\$600,000

Due to the various budgeting cycles for numerous industry stakeholders and the on-going recruitment of additional funders, it is requested that commitments over and above the \$600,000 from the Lignite Energy Council and industry stakeholders be matched by Industrial Commission funding of an increased corresponding amount. Alternatively, matching funds from the State may be smaller than \$600,000 annually if the production of lignite is reduced because of early closure of lignite-based facilities.

LRC-104B

Title: “Phase I Bridge Study for CCS at Coal Creek Station”

Submitted By: Rainbow Energy Center

PM/PI: Conway Nelson

Duration: 10 months

Purpose: Rainbow Energy Center is proposing to continue optimizing the process design and economics for a carbon capture system at the Coal Creek Station. The bridge study would be performed in parallel to the ongoing redundancy and Front-End Engineering and Design studies to reduce risks and optimize costs. The project would leverage state funding with matching cash from REC over the 10-month effort.

Funding: NDIC: \$1,094,416; Total Project Costs: \$2,188,833

Technical Advisor’s Recommendation:

Fund – The proposed project is important to the Lignite Research Program, as part of the carbon management efforts for North Dakota lignite. Results would be valuable for any plant considering carbon capture and storage in the immediate region. All three of the technical reviewers recommended funding, and the proposal received an average score of 225 out of 250. The project provides leveraging of state funding through industry cash equivalent and in-kind cost share.

Funding would be subject to the following:

- Technical advisor participates in project reviews.
- Technical advisor reviews the project management plan with the project team.

Conflicts of Interest:

EERC, Rainbow Energy Center and North American Coal Falkirk Mine (indirect).

Conflicts of Interest: Rainbow Energy Center, EERC, Falkirk-indirectly.

Reviewers: Fund - 3; Consider Funding - 0; Do Not Fund – 0

LRC: Fund: Yes - 13; No – 0: Abstain - 1



2875 Third Street SW
Underwood, North Dakota 58576
701.207.9988

April 4, 2024

Mr. Reice Haase
Deputy Executive Director
ATTN: Lignite Research, Development and Marketing Program
North Dakota Industrial Commission
State Capitol – 14th Floor
600 East Boulevard Avenue, Department 405
Bismarck, ND 58505-0840

Dear Mr. Haase:

Subject: REC Proposal Entitled "Phase I Bridge Study for CCS at Coal Creek Station"

Rainbow Energy Center (REC) is pleased to submit this proposal to the Lignite Research, Development and Marketing Program. The \$100 application fee is provided through ACH Transaction Number 091310750050064. REC is committed to completing the project as described in the proposal if the Commission makes the requested grant.

If you have any questions, please contact me by telephone at (306) 529-9426 or by email at Conway.Nelson@rainbowenergycenter.com.

Sincerely,

DocuSigned by:
Handwritten signature of Conway Nelson in blue ink.
1532A5E195574DD...

Conway Nelson, P. Eng., PMP
Director, Carbon Management

CN

c: Erin Stieg, North Dakota Industrial Commission

Lignite Research, Development
and Marketing Program

North Dakota Industrial Commission

Application

Project Title: Phase I Bridge Study for CCS at
Coal Creek Station

Applicant: Rainbow Energy Center

Principal Investigator: Conway Nelson

Date of Application: April 4, 2024

Amount of Request: \$1,094,416

Total Amount of Proposed Project: \$2,188,833

Duration of Project: 10 months

Point of Contact (POC): Conway Nelson

POC Telephone: (306) 529-9426

POC Email:

Conway.Nelson@rainbowenergycenter.com

POC Address: 918 East Divide Avenue,
Bismarck, ND 58504

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ABSTRACT

Objective: This project will support Rainbow Energy Center's (REC's) Coal Creek Station carbon capture plant front-end engineering and design (FEED) through Phase I of a bridge study focused on creating the most cost-effective plant while ensuring a high level of reliability. Carbon capture from coal-fired power generation is a relatively new technology that brings a higher degree of operational risk and depends on high reliability and low-cost construction and operation for success. The FEED study, commenced on February 1, 2022, and redundancy study, commenced on May 26, 2023, have identified several opportunities to optimize the process design and pursue a more cost-effective design under this bridge study.

Expected Results: Key outcomes from Phase I of this focused study will be a thorough review of the initial construction cost estimate and the development of an optimal design for the proposed REC capture plant. The results of Phase I of the study will provide REC with essential information to execute a second phase of the bridge study that updates the construction and operating cost estimates based on an optimized design to support a final investment decision. This effort also supports the original REC Coal Creek Station carbon capture project's intent to 1) reduce the technological and economic risks associated with investing in a postcombustion capture retrofit project and 2) provide information and learnings that will enable valuation and deployment of similar North Dakota facilities.

Duration: 10 months (February 1, 2024 –November 30, 2024).

Total Project Cost: \$2,188,833. REC will contribute \$716,897 as cash cost share and \$377,520 as in-kind cost share and requests \$1,094,416 from the North Dakota Industrial Commission (NDIC) Lignite Research, Development and Marketing Program (LRDMP).

Participants: REC will lead the project in partnership with NDIC through LRDMP. Additional partners include the International CCS Knowledge Centre, Energy & Environmental Research Center, Mitsubishi Heavy Industries America, Sargeant & Lundy, and Burns & McDonnell.

PROJECT SUMMARY

Rainbow Energy Center (REC) proposes a two-phase bridge study to complement the ongoing front-end engineering and design (FEED) and redundancy studies on carbon capture at Coal Creek Station. This project is Phase I of the bridge study and will focus on determining an optimal system design based on additional flue gas characterization and a thorough review of the initial construction cost estimate.

Carbon capture from coal-fired power generation is a relatively new technology that introduces a higher degree of operational risk and depends on high reliability and low-cost construction and operation for success.

The project team will thoroughly review the cost estimate from the FEED study; further characterize the Coal Creek Station flue gas; conduct a reliability, availability, maintainability (RAM) study; and finalize the process design. Upon completion of this project, it is anticipated a second phase of the bridge study will be pursued to refine the cost estimate, prepare a project execution plan, and finalize the permitting strategy for construction of the capture system. The carbon capture system (CCS) design and, where appropriate, balance-of-plant (BOP) integration and design will reflect data gathered during the flue gas characterization and RAM study. Specifically, changes may occur to the size and level of redundancy of various systems in the carbon capture plant (CCP), the CCP layout, pretreatment equipment, piping and supports, electrical design (power distribution center), design of the structural/building steel and, possibly, the plant footprint and foundation. These changes will also be reflected (where necessary) in an updated design package that includes general arrangement drawings; process flow diagrams; P&IDs (piping and instrumentation diagrams); electrical diagrams; tie-in list; equipment list; and preliminary structural, civil, and architectural drawings.

PROJECT DESCRIPTION

Objectives: The objective of this project is to support REC's Coal Creek Station CCP FEED through Phase I of a bridge study that will focus on optimizing the CCS design based on additional flue gas

characterization and thoroughly reviewing the initial construction cost estimate. The FEED study, commenced on February 1, 2022, and redundancy study, commenced on May 26, 2023, have identified several opportunities to optimize the process design and pursue a more cost-effective design. To achieve these objectives, the project team proposes completion of a bridge study that will closely examine the following areas to meet the study objectives:

1. Perform an open book review with technology and construction partners to validate the Class 3 project estimate that was produced during the FEED study.
2. Perform testing and analysis to further characterize the Coal Creek Station flue gas to reduce operating risks associated with the CCP.
3. Optimize and finalize the process design based on flue gas testing and a RAM study.

Methodology: The following tasks outline the proposed bridge study as the next phase in the necessary due diligence process in project development. The study is scoped such that the project will be able to begin construction by December 31, 2032, a requirement for 45Q tax incentives. The methods in the proposed Phase I of the bridge study will ensure a thorough understanding of the preliminary capital cost estimate and optimize the technical scope of work in sufficient detail to allow the project cost estimate to be revised in Phase II of the bridge study (to be pursued in the fall of 2024). Four tasks have been identified to execute this work. Additional details can be found in Appendix A, which contains estimates from subcontractors. Some of the subcontractor proposals may contain quotes for Phase I and Phase II. Phase II scopes and pricing will be updated when the team decides to move forward with Phase II.

Task 1 – Cost Estimate Review and Validation

This task will consist of a thorough review of the carbon capture and BOP capital and operating cost estimates to ensure a thorough understanding of these foundational estimates. The review will include a

constructability analysis to consider innovative opportunities for construction cost reductions and a reorganization of the FEED estimate to allow adjustments by process system during subsequent tasks.

Task 2 – Flue Gas Characterization

The FEED study produced a Class 3 cost estimate for a CCP design based on the pilot test completed in 2020 and a level of equipment redundancy that maximizes availability of the CCP. This test was part of a larger study that was cofunded by the North Dakota Industrial Commission (NDIC) and U.S. Department of Energy (DOE). The pilot test was completed to satisfy Subtask 2.7 of this DOE study: WESP (wet electrostatic precipitator) and Aerosol Testing at Coal Creek Station.

The pilot test satisfied the intended goals of reducing aerosol formation in CCSs by utilizing WESP technology and a proprietary Mitsubishi Heavy Industries America (MHIA) amine emission reduction (AER) unit. The test also studied the impact of aerosols on the efficiency and degradation products of carbon capture amines. The purpose of this test was not to study the optimal design parameters for a CCP for Coal Creek Station but rather to give an indication of the feasibility of such an installation.

During the FEED study, it was determined that additional flue gas testing was necessary to supplement the information gathered in the pilot. In February 2024, the project team measured the levels of flue gas constituents that may cause accelerated amine degradation or equipment fouling (constituents such as iron and other metals, NO_x, and particulate matter [fly ash] were measured). The results of this flue gas testing will be used to determine process adjustments that may be necessary to minimize the risk of accelerated amine degradation.

Additional flue gas testing is planned to measure the presence of very small, submicrometer fly ash particles in the Coal Creek flue gas. These micro-fly ash particles were not specifically measured in the latest round of flue gas testing and are expected to have a larger effect on amine degradation than larger fly ash particles. These collected samples may also be used for the laboratory tests discussed below.

In addition to flue gas testing, laboratory tests will be conducted by the Energy & Environmental Research Center (EERC) to examine the potential for Coal Creek fly ash to cause degradation reactions with the proprietary MHIA amine. This is a known problem with a full-scale CCP that is operating on a coal-fired power plant. The level of particulate in the Coal Creek flue gas is lower than the existing unit that exhibits this issue; however, it is critical to understand how the specific Coal Creek fly ash will interact with the specific MHIA amine.

Task 3 – Process Design Finalization

The results of the flue gas characterization work completed in Task 2 will be used to finalize the process design, including the potential need for a WESP for flue gas pretreatment and potential adjustments to the CCP system to effectively control amine degradation.

A high level of redundancy was included in the CCP design (n+1 approach for key equipment) to maximize reliability. A systematic RAM study will be completed in Task 3 to determine an optimal level of redundancy in the process design that will minimize costs while ensuring reliable operation of the CCP.

Prior to finalizing the process design, a hazard and operability (HAZOP) analysis will be completed to ensure that the revised design will not cause operability problems with Coal Creek Station or the new CCP.

Task 4 – Project Management and Reporting

REC, with assistance from the EERC, will manage the cost, scope, and schedule of Tasks 1–3 by holding regular progress meetings with the team and updating progress relative to the project schedule as well as prepare a final report incorporating the results of the FEED and redundancy studies as well as this bridge study.

Anticipated Results: The CCS design packages to be revised may include 1) site plan: civil and architectural, 2) electrical, 3) instrumentation, 4) controls, 5) machinery, 6) piping, 7) structural, 8) tie

points, 9) cost, 10) schedule, and 11) layout. Key outcomes from this bridge study will be an optimized system design and an understanding of the initial construction costs, which will allow REC to move forward with Phase II of the bridge study that will update the cost estimate based on the optimized design and begin project development steps, including permitting and initial procurement.

Facilities: REC maintains offices in Bismarck, North Dakota, and at Coal Creek Station between Underwood and Washburn, North Dakota. The EERC, located in Grand Forks, North Dakota, has over 254,000 square feet of facilities for technology demonstration, process modeling, and project execution. Additional primary subcontractors, International CCS Knowledge Centre, Sargent & Lundy, Burns & McDonnell (BMcD), and MHIA, maintain office and computing facilities in Regina, Saskatchewan; Chicago, Illinois; Kansas City, Kansas; and Houston, Texas, respectively.

Resources: The bridge study primary team of industry experts, BMcD (BOP engineer), Sargent & Lundy (owner's engineer), and MHIA (CCS technology owner), will perform project design activities. International CCS Knowledge Centre, the EERC, and plant owner REC will provide review of designs and advisory services. REC will be the prime applicant, with additional project administrative services provided by the EERC. The project team is committed to providing all necessary personnel and resources to ensure the timely completion of all activities outlined in this proposal.

The EERC's engineering and scientific research staff is equipped with state-of-the-art analytical, modeling, and engineering facilities to address a wide variety of energy, environmental, and mineral resource research topics.

Sargent & Lundy, the International CCS Knowledge Centre, MHIA, and BMcD have been a part of project teams that have executed similar project scopes of work focused on North Dakota utilities. MHIA (with assistance from Kiewit, the designated CCS detailed engineering, procurement, and construction contractor) brings experience gained from design and construction of the 240-MW system at the Petra Nova facility in Texas as well as another dozen commercial projects around the world. The International

CCS Knowledge Centre brings experience from the capture system installed at SaskPower's 115-MW Boundary Dam Power Station.

Techniques to Be Used, Their Availability and Capability: The primary technique for data generation under this project will be to use recognized and generally accepted good engineering practices (RAGAGEP) and costing techniques. The individual partners and subcontractors mentioned within the proposed project represent decades of experience in CO₂ capture and coal plant operations. All project participants have committed the necessary resources to execute this project. These same industry experts have been a part of several pre-FEED and FEED projects on similarly sized systems within North Dakota. In addition to the engineering design work, flue gas testing will be carried out in accordance with standard testing procedures and protocols.

Environmental and Economic Impacts while Project Is Underway: The majority of the proposed work is a paper study and will not have an environmental impact to the FEED study area or partner facilities. A limited amount of flue gas sampling and fly ash collection will take place at Coal Creek Station, and some laboratory analysis will take place at the EERC. Both of these locations are sites where these types of activities occur on a daily basis and are equipped to mitigate any potential environmental impacts.

Ultimate Technological and Economic Impacts: The proposed bridge study is a necessary due diligence process in project development and will provide vital information to secure financing for CO₂ capture at Coal Creek Station. Financing and CCS project business cases continue to be reliant on federal 45Q tax incentive programs that require projects must begin construction by December 31, 2032. Continued investment in this project ensures that this initiative can be economically viable and successfully move along the project development path. Subsequent projects will have a better understanding of challenges with ash constituents, resiliency, and cost and will be better informed and more likely to succeed and make progress toward Governor Burgum's goal of North Dakota carbon neutrality by 2030. The later projects will benefit by being provided with key information relating to considerations for cost and

reliability as well as information on specific carbon capture technologies. By seeking a way to cost-effectively use lignite in a carbon-constrained world, this project supports the core mission of the Lignite Research, Development and Marketing Program (LRDMP) to develop large-scale commercial projects that reduce environmental impacts and increase sustainability of energy production and delivery.

Maintaining and adding jobs will also be a key economic factor for long-term implementation of carbon capture, utilization, and storage (CCUS) in North Dakota. The power industry and a newly created CCUS industry will preserve and gain new careers as a result of the proposed project. If North Dakota can produce a lower-carbon-intensity power product by implementing CCUS at lignite-fired power plants, the state will be able to maintain a reliable baseload power source that can ensure electricity security for North Dakota and complement existing and future renewable generation in the state, adding thousands of direct, long-term careers in the process. If the proposed work moves into construction and deployment phases, Coal Creek Station and the Falkirk Mine will retain the current 700 direct/indirect jobs and add approximately 35–40 direct jobs. Additionally, short-term construction jobs are likely to be over 2000 direct/indirect jobs (Stanislawski and others, 2019).

Why the Project Is Needed: This project is needed to ensure the most cost-effective and reliable capture system is designed for Coal Creek Station, a vital generating asset in our state and region. The 2019 Polar Vortex (which caused severe limitations of wind power generation capacity and natural gas availability) that swept through the Midwest in early 2019 and the 2021 Electric Reliability Council of Texas (ERCOT) challenges are profound reminders of why we need to keep our entire power generation mix secure and reliable; CCUS can serve as a long-term solution to carbon emissions while continuing to provide firm baseload generation to mitigate the impact of increasing intermittent renewable generation on grid reliability. Coal Creek Station can serve as a model and learning opportunity for the rest of the nation's existing coal fleet and provide baseload power with reduced CO₂ emissions. As with the current CCS FEED study, results from this study will support the mission of the LRDMP to

concentrate on near-term, practical research and development projects that provide the opportunity to preserve and enhance development of our state's abundant lignite resources. A final report and update reports as requested will summarize the findings of this study, which will be useful for other North Dakota businesses that wish to pursue carbon capture projects.

STANDARDS OF SUCCESS

This project is a necessary next step on the development path for CO₂ capture at Coal Creek Station. Successful outcomes for the project include development of an optimized CCP design that ensures a high level of reliability and a thorough review of the initial cost estimate, preparing the team for Phase II of the bridge study that will determine a detailed project cost estimate for 95% CO₂ capture at Coal Creek Station.

BACKGROUND/QUALIFICATIONS

Background: Many of the project participants have been involved in the pre-FEED study, current FEED study, and redundancy study for installing a CCP at Coal Creek Station. As with the pre-FEED, MHIA is the technology provider in the current FEED study, redundancy study, and proposed bridge study. MHIA is a globally recognized expert in amine-based carbon capture and was the technology provider for the Petra Nova project at the W.A. Parish plant in Texas, which is the world's largest postcombustion carbon capture facility installed on an existing 240-MW coal-fueled power plant. The lessons learned from this full-scale experience have provided the best methods and control technologies for use at Coal Creek Station. The involvement of the International CCS Knowledge Centre has also introduced lessons learned from the Boundary Dam Unit 3 CCS project. The pre-FEED and FEED studies for Coal Creek Station included development of design packages, cost and performance estimates, and a process hazard analysis (PHA, commonly called HAZOP) for both the capture facility and for BOP systems, including, among others, the following systems:

- Flue gas extraction, pretreatment, and handling.

- Steam extraction.
- Cooling water supply and heat rejection equipment.
- Electrical distribution systems.
- Fire protection.
- Plant and instrument air.
- Process control systems.
- Demineralized water supply.

Slipstream Capture Testing

Although solvent-based carbon capture is common in gas processing, postcombustion carbon capture from low-rank coal-fired power stations remains a very new technology at the scale proposed in the ongoing work. With any new technology, there is always a risk that full-scale performance will not be as expected. The EERC, REC, and MHIA have previously demonstrated 78 days of solvent performance at Coal Creek Station using a slipstream system installed on Unit 1 of the plant. During this testing, solvent was sampled weekly and analyzed for a wide variety of materials known to be concerns for solvent degradation. Over the course of more than 2 months of continuous operation, accumulation of these materials was examined and reported to the project team. The solvent performance remained steady without indications of major loss of capture capacity. This experience gave preliminary confidence that MHIA's KS1™ and KS-21™ solvent technology is likely to perform well at Coal Creek Station with the unique flue gas from this plant. The next steps proposed in the bridge study are to further test and validate the findings of the slipstream work with additional sampling and laboratory work.

One key factor that has arisen as a concern for postcombustion carbon capture at coal-fired power plants in recent years is solvent loss to aerosol formation. Although this is not a major source of amine loss in traditional CO₂ capture units for natural gas, the very fine fly ash from coal-fired power plants provides surface area where volatile amines can condense to form submicrometer aerosols. This

aerosol mist is difficult to recover using conventional methods. In flue gas from low-rank coals, this aerosol formation can lead to amine losses that are much higher than would be expected from traditional vaporization losses.

During on-site slipstream testing at Coal Creek Station, the EERC worked with MHIA to test MHIA's AER technology for minimizing aerosol losses. During operation with the AER unit, amine was below the 0.1-ppm detection limit at the system outlet, and daily sampling of the solvent over the course of more than 2 months of operation showed that amine content was stable within the expected range. By contrast, during short-term operation with conventional demisting technology, the aerosol and amine contents were significantly higher. Moreover, measurements conducted on the same system using a conventional monoethanolamine (MEA) solution and a traditional water wash section showed large increases in aerosol content through the capture system. These results demonstrate that MHIA's proprietary combination of solvent and AER technologies are likely to be effective at limiting amine losses to aerosols at Coal Creek Station. As noted in the methodology section, the project team will be considering implementing a WESP to further mitigate impacts to the solvent and amine emissions.

FEED/Redundancy

The results from the pre-FEED and slipstream tests provided initial information for the project team to build directly into the current FEED and redundancy study. The proposed bridge study will support efforts to improve cost and manage risk with reliability/availability of the carbon capture facility and will run concurrently with the current FEED/redundancy study.

The FEED study was focused on the addition of a full-scale postcombustion CCS that will capture 95% of CO₂ emissions at the 1100-MWe Coal Creek Station. The capture system design features 1) steam cycle integration with advanced heat recovery to improve energy efficiency, 2) an integrated solution for aerosol emissions to improve environmental and operating costs, 3) design of the world's largest capture facility (9.0 million tonnes/yr, representing 19% of the CO₂ from North Dakota's stationary

sources), 4) engineering for cold-climate performance, and 5) equipment redundancy to improve CCS reliability and availability.

To date, the project team has completed many aspects of the FEED and redundancy projects and is taking a deeper dive into reliability based on additional flue gas characterization and creating the most efficient and cost-effective design that is possible. The bridge study will build off of the work completed to date.

Qualifications: REC is the project lead and the proud owner and operator of Coal Creek Station. The REC team works to maximize efficient energy production and sound energy management to unlock the energy sector's full potential. REC is working diligently to capitalize on innovative technologies so that future generations have sustainable energy solutions. REC is committed to providing reliable, low-carbon, baseload power to North Dakota and the region. Carbon capture is vital to the success and continued operation of Coal Creek Station, and REC is committed to delivering carbon capture that will serve as a showcase for future projects around the world. Mr. Conway Nelson, Director of Carbon Management, will be the overall project manager. Mr. Nelson will focus on ensuring the overall success of the project by providing experienced management and leadership to all activities within the project. Mr. Nelson will ensure that the project is carried out within budget, schedule, and scope. Mr. Nelson will also be responsible for communication with project partners and REC project personnel. Additional key personnel from REC include Stacy Tschider (CEO), Jeff Jonson (President), Chris Faul (VP Operations), Lyndsey Roemmich (VP Finance), Jessica Bell (VP External Affairs), Jon Price (Director, Projects), Dalton Norton (Project Engineer), and John Bauer (Plant Manager). Letters of commitment from each entity can be found in Appendix B, and qualifications of all key personnel can be found in Appendix C. The organizational chart for the bridge study is shown in Figure 1.

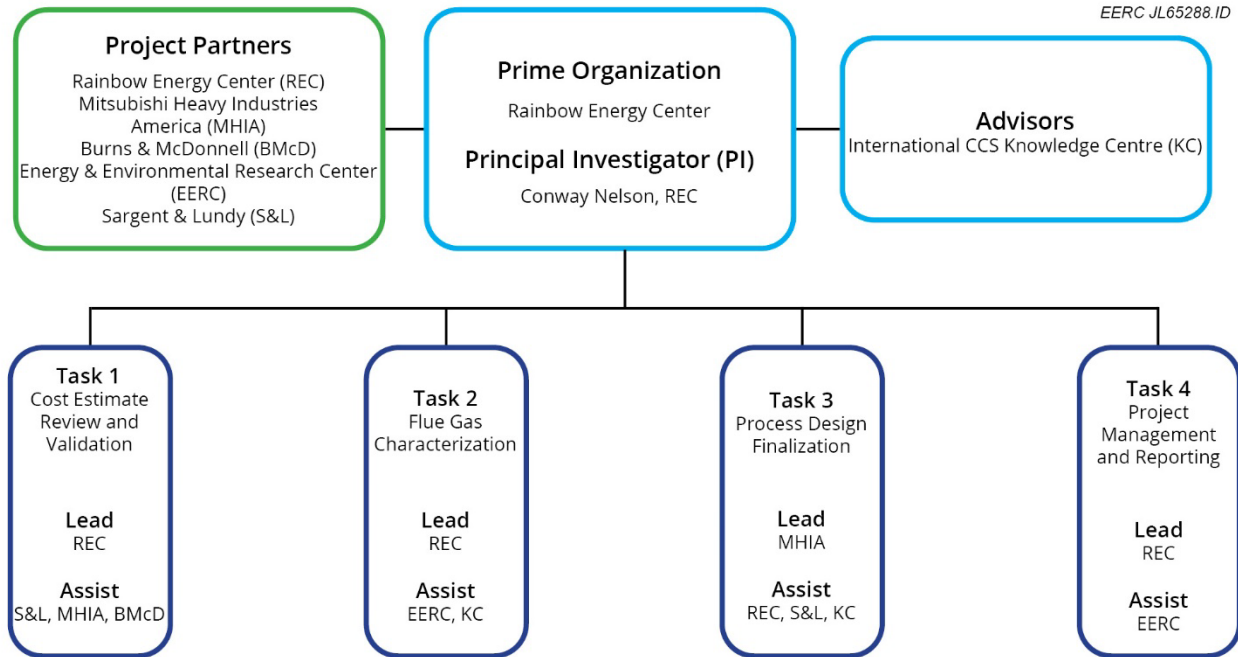


Figure 1. Organization chart.

The EERC is the lead for the current FEED and redundancy projects and will aid with project administration, flue gas analysis, and overall design/costing review. Mr. Jason Laumb, Director of Advanced Energy Systems Initiatives, will be managing the EERC efforts and is the current project manager for the FEED and redundancy studies. Mr. Laumb will also be responsible for communication with EERC project personnel.

Mitsubishi Heavy Industries America, Inc., and Mitsubishi Heavy Industries Engineering, Ltd., are subsidiaries of Mitsubishi Heavy Industries, Ltd., of Japan (together referred to as MHIA). MHIA will be responsible for the CCS scope. Starting in the early 1990s, MHIA jointly developed with Kansai Electric Power Company (KEPCO) the proprietary Kansai Mitsubishi Carbon Dioxide Recovery Process (KM CDR Process™) for carbon dioxide removal from combustion gas exhaust streams. MHIA's KM CDR Process™ is an amine-based CO₂ capture process that uses MHIA proprietary solvents. The CCS is capable of recovering 95% of the CO₂ from the flue gas and compressing the treated CO₂ to adequate pipeline conditions. MHIA has provided 13 commercial CCSs around the world, including the world's largest

postcombustion system capturing 5265 stons/day from a coal-fired power plant in Thompsons, Texas (Petra Nova) for enhanced oil recovery (EOR). Key personnel from MHIA include Mr. Tim Thomas (Senior Vice President and Deputy General Manager), Mr. Takashi Kurioka (Project Manager), and Mr. Hiro Tanaka (Engineering Manager).

BMcD will be responsible for BOP engineering. BMcD is a fully integrated engineering, architecture, construction, environmental, and consulting firm with a multidisciplinary staff of more than 7600 professionals. Founded in 1898, its singular mission has been to make its clients successful. Because BMcD is relationship-focused and dedicated to creating amazing success for its clients, it has a 90% repeat-business rate and client partnerships that span multiple decades. Being 100% employee-owned means that everyone has an ownership stake in the success of the clients and all team members are driven to find great solutions. Key personnel from BMcD include Mr. Aaron Bennett, Project Manager, and Ms. Patricia Scroggin-Walker, Carbon Capture Director. Additional B&McD team members include Doug Randall and Justin Schnegelberger.

Sargent & Lundy will serve as the owner's engineer, with involvement in all aspects of the project, including a focus on permitting strategy development. Sargent & Lundy is a Chicago-based firm that offers the technological know-how for making informed decisions when evaluating and implementing postcombustion CCUS technologies. Sargent & Lundy is an industry leader in CO₂ capture technologies with experience and capabilities for executing pilot- to commercial-scale projects. Sargent & Lundy CCUS services encompass feasibility studies, preliminary conceptual designs, FEED studies, plant integration planning, BOP detailed designs, permitting support, and project and construction management. Sargent & Lundy teams have collaborated with technology suppliers, utilities, investors, and others to support the evaluations and development of new CO₂ capture initiatives and opportunities. Sargent & Lundy key participants are Kevin Lauzze, Project Director, and Donna Eglar, Project Manager.

The International CCS Knowledge Centre will be involved in all technical aspects of the project. The CCS Knowledge Centre provides independent, expert advisory services for CCS/CCUS projects across multiple industries based on its team's unparalleled experience developing the world's first fully integrated postcombustion CCS facility on a coal-fired power plant at SaskPower's 115-MW Boundary Dam Unit 3. Key participants from the International CCS Knowledge Centre activities are Everett Rueve, Project Manager; Colin Campbell, Principal Chemical Specialist; and Yuewu Feng, Senior Engineer.

There are additional project participants not named specifically in the text that will be providing services to the project and paid with REC in-kind contributions. These subcontractors will provide flue gas sampling services, advisory services, and conduct a RAM study.

VALUE TO NORTH DAKOTA

The proposed bridge and the ongoing FEED and redundancy projects' primary value to North Dakota will be maintaining and adding new jobs to the state and local economies in areas where current and new regulations threaten to significantly reduce activity in coal utilization, one of the state's most vital resources. The power industry and a newly created CCUS industry that will result from this project will preserve and gain new careers. If North Dakota can produce a lower-carbon-intensity power product by implementing CCUS at coal-fired generation units, the state will be able to maintain a reliable baseload power source that can be used to complement existing and new renewable generation in the state, adding thousands of direct, long-term careers in the process. If the proposed work moves into construction and deployment, Coal Creek Station and the Falkirk Mine will retain the current 700 direct/indirect jobs and add approximately 35–40 direct jobs. Additionally, short-term construction jobs are likely to be over 2000 direct/indirect jobs (Stanislawski and others, 2019).

Beyond the plant, the lignite-fired power plants in North Dakota present an opportunity to economically demonstrate the large-scale feasibility of CCS for the existing domestic coal fleet that is unique to North Dakota. The North Dakota plants are optimally located near both appropriate geologic

storage and fields amenable to EOR operations, an advantage not found in other parts of the world. The economic health of the central region of North Dakota is tied to energy jobs in the area, and advancing CCUS technologies here can help show the world how projects such as these can be successful.

Currently, the lignite industry directly employs 3623 people, with another 9500 indirect employees supported by the industry, accounting for over \$5.4 billion in economic impact. Technology advances that continue the responsible use of lignite and bring new industries to the region are critically needed to sustain and grow these jobs. Based on a recent study by the EERC, the economic impact to a state such as North Dakota from development of a new carbon capture and EOR industry would be tremendous if deployed statewide: \$2.5 billion – \$3.0 billion in annual economic activity, state revenue increase of \$160 million per year, and creation of approximately 8000 long-term jobs (Stanislawski and others, 2019). This diversification provides additional stability to a state heavily reliant on a commodity-based economy.

At a project level, the cost and benefits of a redundancy/sparing approach to the ongoing FEED project will benefit the entire lignite fleet. The project will also provide a basis for identifying and evaluating those systems, equipment, and parts essential to maintaining high availability and reliability of the installed CCS. Because space limitations exist at all utility sites, results from this study will identify probable changes to the support structure and overall equipment layout required to implement a capture island at an existing plant. This project will reduce risks: both technological and economic risks associated with investing in a postcombustion capture retrofit project.

The primary deliverable for the project will be a completed Phase I bridge study report. The report will include finalization of an optimized process design, including revised equipment lists, process flow diagrams, P&IDs, electrical load list and single-line diagram, evaluation of possible civil and structural changes required to support the additional equipment recommended within the CCP island, and a summary of the basis for the initial cost estimate. It is expected that the tasks associated with the

proposed study will be completed by November 30, 2024, running concurrently with the ongoing FEED and redundancy projects.

MANAGEMENT

REC is the lead organization for this project and will oversee all associated tasks and management activities. REC will schedule regular internal and external meetings with project staff and advisors to ensure that the project is conducted in accordance with the project plan (budget, schedule, deliverables, and milestones) and meets quality objectives. These meetings will be used to review project status, risks, issues, and potential adjustments to the project plan. REC will keep all partners informed of project progress and coordinate activities as necessary for the execution of a successful project and will be responsible for timely submission of all project deliverables and transfer of data and products to the team.

TIMETABLE

The overall project timeline can be found in Figure 2. The proposed bridge study is expected to require 10 months, with a projected completion date of November 30, 2024. Some portions of the project are underway, as flue gas testing was completed at Coal Creek Station in February 2024. This initial work was funded by REC and was necessary to keep the project moving. Additional work will start in earnest upon approval from NDIC. This timeline is necessary to maintain a schedule that could allow for construction activities to begin before December 31, 2032.

BUDGET AND MATCHING FUNDS

The proposed budget is \$2,188,833, with \$1,094,416 from NDIC and \$1,094,417 of cash/in-kind support from REC. The budget includes subcontracts for all key subcontractors and those providing services noted in the proposal for Phase I. The detailed breakdown is shown in Table 1. Budget notes can be found in Appendix D. Cash cost share in the amount of \$716,897 will be provided by REC.

Coal Creek Station - Carbon Capture Bridge Study

EERC JL65287.AI

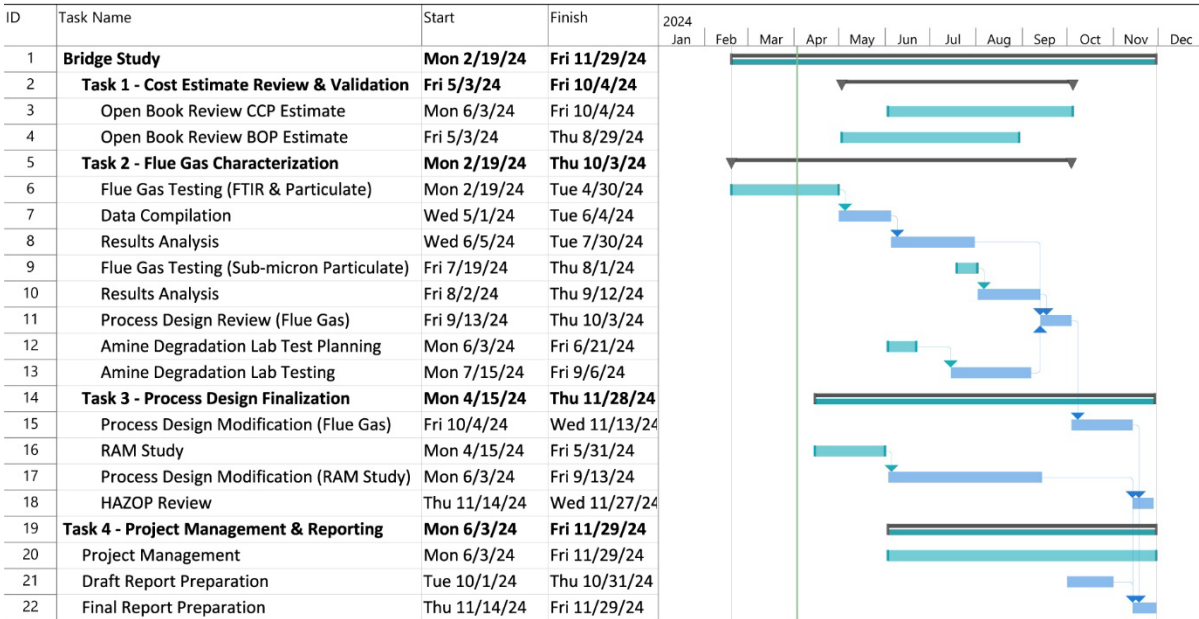


Figure 2. Project timeline.

Project Associated Expense	NDIC Share (Cash)	REC Share (In Kind)	REC Share (Cash)	Total Project
REC Staff and Subconsultant (in-kind)		\$377,520		\$377,520
Flue Gas Testing			\$200,000	\$200,000
International CCS Knowledge Centre			\$258,811	\$258,811
EERC	\$426,302			\$426,302
Sargent & Lundy (Owner's Engineer)	\$213,114		\$191,886	\$405,000
MHIA	\$455,000			\$455,000
B&McD			\$66,200	\$66,200
Total	\$1,094,416	\$377,520	\$716,897	\$2,188,833

TAX LIABILITY

REC has no outstanding tax liability.

CONFIDENTIAL INFORMATION

No confidential information is contained in this proposal.

REFERENCES

Stanislawski, J.J.; Folkedahl, B.C.; Jensen, M.D.; Musich, M.A. *Regional Impacts of Carbon Capture and Sequestration in the State of North Dakota*; Final Report for Lignite Energy Council; EERC Publication 2019-EERC-02-07; Energy & Environmental Research Center: Grand Forks, ND, Feb 2019.

APPENDIX A

SUBCONTRACTOR PROPOSALS



April 2, 2024

Mr. Conway Nelson
Director of Carbon Management
Rainbow Energy Center
918 East Divide Avenue
Bismarck, ND 58504

Dear Mr. Nelson:

Subject: EERC Proposal No. 2024-0163 Entitled “Support for Bridge Study Phase I”

Introduction

The Energy & Environmental Research Center (EERC) is pleased to support Rainbow Energy Center (Rainbow) in its Bridge Study Phase I project for the North Dakota Industrial Commission (NDIC) Lignite Research Program (LRP). The EERC has a long history of working with NDIC and has worked with Rainbow through its front-end engineering and design (FEED) and redundancy studies that have led to this proposed effort. The EERC will use this experience to support the proposed project.

The EERC will support the following tasks within Rainbow’s scope of work submitted to LRP.

Task 1 – Cost Estimate Review and Validation

The EERC will provide a support role in this task, which will consist of reviewing the carbon capture and balance-of-plant (BOP) capital and operating cost estimates to ensure a common understanding of these foundational estimates. The review will include a constructability analysis to consider innovative opportunities for construction cost reductions and a reorganization of the estimate to allow adjustments by specific process systems during subsequent tasks.

Task 2 – Flue Gas Characterization

The EERC will provide a support role for the flue gas characterization work. During the FEED study, it was determined that additional flue gas testing was necessary to measure the levels of flue gas constituents that may cause accelerated amine degradation or equipment fouling (constituents such as iron and other metals, NO₂, and particulate matter [fly ash] were measured). The results of this flue gas testing will be used to determine process adjustments that may be necessary to minimize the risk of accelerated amine degradation.

The EERC will play a primary role in designing and executing a laboratory study under this task. In addition to the flue gas testing, laboratory tests will be conducted by the EERC to examine the potential for Coal Creek Station fly ash to cause degradation reactions with the proprietary Mitsubishi Heavy Industries, Ltd. (MHI) amine. The EERC will perform experimentation where the MHI amine is exposed to fly ash from Coal Creek Station over long durations. The exposed amine will be periodically sampled and analyzed for products of degradation in EERC laboratories. The specific experimental design will be developed in concert with Rainbow and other project participants.

Mr. Nelson/2
April 2, 2024

Task 3 – Process Design Finalization

The results of the flue gas characterization work completed in Task 2 will be used to finalize the process design, including the potential need for a wet electrostatic precipitator (WESP) for flue gas pretreatment and potential adjustments to the carbon capture plant (CCP) system to effectively control amine degradation. The EERC will play a support role in this task by making recommendations based on the results of the flue gas characterization and amine degradation studies.

A high level of redundancy was included in the CCP design (n+1 approach for key equipment) to maximize reliability. A systematic reliability, availability, maintainability (RAM) study will be completed in Task 3 to determine an optimal level of redundancy in the process design that will minimize costs while ensuring reliable operation of the CCP.

Prior to finalizing the process design, the EERC will support a hazard and operability (HAZOP) analysis to ensure that the revised design will not cause operability problems with Coal Creek Station or the new CCP.

Task 4 – Project Management and Reporting

The EERC will play a primary management and reporting role in the project. The EERC will aid in managing the cost, scope, and schedule of Tasks 1–3 by helping with scheduling regular progress meetings with the team and updating progress relative to the project schedule.

The EERC will work closely with Rainbow to prepare a final report incorporating the results of the FEED study as well as this bridge study. The EERC will also support the development of interim status updates as required by NDIC.

The total estimated cost for this proposed scope of work is \$426,302 for a project duration of 6 months. Expenses will be invoiced monthly on a cost-reimbursable basis. A detailed project budget is provided as a table in a format requested by the LRP.

Project Associated Expense	NDIC Share (Cash)	Total Project
Labor	\$256,238	\$256,238
Travel	\$557	\$557
Supplies	\$10,000	\$10,000
Laboratory Fees and Services		
Analytical Research Lab	\$5,741	\$5,741
Shop and Operations	\$5,408	\$5,408
Engineering Services Fee	\$2,887	\$2,887
Document Production Services	\$1,489	\$1,489
Total Direct Costs	\$282,320	\$282,320
Facilities & Administration	\$143,982	\$143,982
Total Cash Requested	\$426,302	\$426,302

Mr. Nelson/3
April 2, 2024

We look forward to the opportunity to continue our collaborations with Rainbow on this project. If you have any questions, please contact me by phone at (701) 777-5114 or by email at jlaumb@undeerc.org.

Sincerely,

DocuSigned by:
Jason Laumb

28998A1DC4D60449...

Jason D. Laumb
Director of Advanced Energy Systems
Initiatives

Approved by:

DocuSigned by:

Tami Votava

for

E7468BBB3DE440E...

Charles D. Gorecki, CEO

Energy & Environmental Research Center

JDL/rlo

MAKING
OUR CLIENTS
SUCCESSFUL

**RAINBOW
ENERGY CENTER
CCUS FEED
CONTINUATION
BRIDGE STUDY
PROPOSAL**

SUBMITTED TO:



MARCH 29, 2024

BURNS  MCDONNELL



March 29, 2024
Conway Nelson
Director of Carbon Management
Rainbow Energy
918 E Divide Avenue
Bismark, ND 58504

Re: Rainbow Energy Center CCUS FEED Continuation Bridge Study Proposal - Rev 1

Dear Mr. Nelson,

On behalf of the Burns & McDonnell team and our 14,500+ Employees, we are pleased to present our proposal for the Rainbow Energy Center CCUS FEED Continuation Bridge Study. Our team is uniquely positioned and equipped to support Rainbow Energy Center with these items.

The proposed Scope of Work, Schedule, and Terms and Conditions (Confidential) are attached.

We appreciate being considered and look forward to supporting Rainbow Energy Center in this effort. If you have any questions or need any additional information, please contact Aaron Bennett at 816-894-8852 or me at 816-822-3826.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Chris Ruckman'.

Chris Ruckman
Decarbonization Vice President
Burns & McDonnell

Table of Contents

Scope of Work

Commercial (Confidential)

- *Terms*
- *Rate Sheet*

Scope of Work

The Engineering Scope of Work for the Rainbow Energy Center CCUS FEED Bridge Study has been broken into two (2) task items. Task numbering is intended to align with the task numbering in the overall project Funding Application. Scope for both tasks, costs for the proposed services, and schedule for the deliverables are defined within this Proposal.

Task 3 - Develop a Cause and Effect matrix to support the Study HAZOP for BOP controls philosophy. The only deliverable is a Cause and Effect matrix.

Task 7 - General Project Support

- a. Project management and engineering support for weekly meetings and associated preparation and follow-up tasks for four (4) months. We have estimated anywhere from 4-8 hours per week total effort during this 4 month time period.
- b. Includes a Scope-of-Work kickoff Teams meeting.

Commercial

Pricing

Burns & McDonnell proposes to perform the herein described Scope of Work on a time and materials basis, pursuant to the Schedule of Hourly Professional Services Billing rates included herein. Burns & McDonnell is committed to supporting REC as required throughout the FEED Bridge Period.

Table 1: Summary of Price per Task

	Estimated Hours	Estimated Costs
Task 3 - Cause & Effect Matrix		\$31,700
Task 7 - General Project Support		\$34,500
Total		\$66,200

Schedule

Burn & McDonnell proposes to perform the proposed Scope of Work during a period of four (4) months beginning at award of the FEED Bridge Study Work.

Task 3 - The cause-and-effect matrix will be provided two (2) months after award.

Task 7 - Work will occur through the duration of the Feed Bridge Study.

Terms & Conditions

Burns & McDonnell proposes to provide the proposed services in accordance with the Terms & Conditions for Professional Services included herein (Confidential).

Assumptions & Clarifications

- Burns & McDonnell has assumed a FEED Bridge Study duration of four (4) months.
- 3D Model updates are not included.
- Travel is not anticipated, and no travel costs are included.



CREATE AMAZING.

9400 Ward Parkway
Kansas City, MO 64114
burnsmcd.com



Engineered Systems Division
20 Greenway Plaza Suite 600 Houston, TX 77046 Tel: (713)-351-6400 Fax: (713)-351-6450

April 01, 2024

Mr. Conway Nelson, P.Eng., PMP
Director of Carbon Management
Rainbow Energy Center LLC
2875 Third Street SW
Underwood, ND 58576

By email to: conway.nelson@rainbowenergycenter.com

RE: Proposal for FEED Bridging Work for Rainbow Energy Center Carbon Capture

Dear Mr. Nelson,

Mitsubishi Heavy Industries America, Inc. (MHIA) is pleased to propose to Rainbow Energy Center (REC) "Bridging Work" following the recently completed Front-End Engineering Design (FEED) study for the REC carbon capture project at Coal Creek Station in Underwood, ND. The FEED was based on certain design assumptions and resulted in a $\pm 15\%$ estimate of the engineering, procurement, and construction (EPC) cost for the carbon capture islands. As we understand from our several recent discussions with you, REC would like to revisit certain of the design assumptions for the FEED and estimate potential impacts to the EPC cost.

MHIA supports REC's interest in continuing to advance the carbon capture project. Therefore, for the Bridging Work we propose two primary tasks, as described below.

Task A – Establish Detailed EPC Cost Baseline

In Task A, MHIA and our construction estimating subcontractor will provide to REC a further breakdown of the current EPC cost estimate for the carbon capture islands. Neither the physical scope nor the assumptions behind the current EPC cost estimate will change, but we will develop a breakdown of the current estimate into the following categories:

1. *Bid Tabulation of Major MHI Procurement Items.* This bid tabulation to include:
 - a. Shell & Tube Heat Exchangers
 - b. Plate & Frame Heat Exchangers
 - c. CO2 Compressor (Procurement Estimate Basis)
 - d. CO2 Dehydration Unit
 - e. Flue Gas Blowers
 - f. Large Motors and Pumps
2. *Construction Cost Estimate Breakdown.* This breakdown will include:
 - a. Labor Wage Build-Up
 - b. Permanent Materials Bid Tabulations
 - c. Small Tools & Suppliers Summary (Manhour ST&S vs Direct Estimated ST&S)
 - d. Breakdown of Main Construction Bill of Quantity by Plant Area (Approximate; by MHIA)
 - e. Factored Construction Estimate Breakdown by Plant Area BOQ as Above.

MHIA and our construction estimating subcontractor will review the estimate with REC (2 days in Kansas City or Houston; attendance by MHI Japan staff to be remote/virtual).

Task B – Update Project Design Basis

In Task B, MHIA will work with REC to update the design basis for the carbon capture island based on a series of design option impact studies. We anticipate three primary design option impact studies at this time, as described below. Final study scoping and study execution will be performed collaboratively with REC personnel. For clarity, the design deliverables noted in Task B.1 would be produced only once.

1. **Flue Gas Data Update.** In this study MHIA and REC will evaluate the impact of changes in the current understanding of Coal Creek Station flue gas composition based on the results of recent stack testing and other information, and will evaluate changes to the project design basis as a result of that new flue gas information. In particular, the potential need for a wet electrostatic precipitator and other impurities counter measures, such as solvent filtration and enhanced reclaiming, will be evaluated. As a part of this study the following design deliverables will be developed by MHIA:
 - a. Basic Engineering Design Data (BEDD)
 - b. Block Flow Diagram
 - c. Process Flow Diagram
 - d. Utility Flow Diagram
 - e. Emissions and Effluents List
 - f. Utility Summary
 - g. Process Datasheets for related equipment
 - h. Engineering Drawings for related equipment
 - i. Plot Plan
 - j. Single Line Diagrams
 - k. Electrical Load List
 - l. Technical Analysis Report for new Flue Gas data

Note that the physical scope of these design deliverables will remain within the carbon capture inside battery limits (ISBL) as defined in the recent FEED study. Design of outside battery limits systems will remain within scope of others.

2. **Reliability-Availability-Maintainability (RAM) Update.** In this study MHIA will develop and provide technical data on expected carbon capture component reliability to support a revised RAM analysis for the project to be conducted by REC. During REC's revised RAM analysis MHIA will provide rough-order-of-magnitude advice on potential capital and operating cost impacts of several redundancy changes considered by REC.
3. **Plot Plan Study.** In this study, following conclusion of other relevant studies above, MHIA will support REC evaluation of an alternative layout of the carbon capture project and will develop an alternative plot plan reflecting a preliminary final project design. Although included in our estimated level of effort for the Bridging Work, if MHIA and REC determine that the Plot Plan Study is not required that work can be omitted.

Each design option impact study performed under Task B would include a summary of the key technical implications of the design change, evaluation of the related impacts on the carbon capture system design and performance using MHI design rules-of-thumb and other methods, and estimation of the potential capital and operating cost impacts of the design and performance changes.

MHIA proposes to conduct this work on a time and materials (T&M) basis over a period of six (6) months starting from execution of an appropriate services agreement between MHIA and REC. MHIA would invoice REC monthly for our work, including a breakdown of hours for MHIA and MHI Japan staff, at the hourly rates used during the FEED study (adjusted for inflation). Invoices from our construction estimating subcontractor plus an administrative mark-up of 15% would be passed through to REC as-incurred by MHIA. Travel by MHIA our subcontractor for meetings requested by REC would be invoiced at reasonable and customary rates for business travel in the United States.

MHIA estimates the level of effort for this work to be \$455,000. We anticipate that an overall not-to-exceed cap would be included in the contract for this work.

Performer	Task A Estimate	Task B Estimate	Total Estimate
MHIA (Time and non-Construction Expenses)	\$114,600	\$225,400	\$340,000
Construction Estimator (Time and Expenses)	\$75,000	\$25,000	\$100,000
Total with Mark-Up	\$200,850	\$254,150	\$455,000

MHIA understands that following the two tasks above, REC may wish to extend the Bridging Work into a second phase that would include revising the FEED study including cost estimating for the selected final project design, as well as development of associated commercial arrangements and firm pricing for project execution. It is difficult to accurately estimate costs for such a second phase at this time, but prior MHIA experience suggests 9 – 12 months would be required for such an effort, and depending on level of redesign required after the current FEED, cost could range from \$1 million to \$5 million or more for this work.

If you have any questions about this proposal, please do not hesitate to reach out to me at the number below or contact Hirotaka Tanaka at +1 832-206-9323 / hirotaka.tanaka@mhia.com.

Sincerely,



Mike Fowler
 Vice President, Business Development
 Engineered Systems Division
 Mitsubishi Heavy Industries America, Inc.
mike.fowler@mhia.com
 +1 832-207-9499

Attachments: MHIA and Construction Estimating Subcontractor Rate Sheets (Confidential)



Kevin Lauzze
Senior Vice President & Project Director
(312) 269-2015
kevin.c.lauzze@sargentlundy.com

April 3, 2024 – Revision 1

Coal Creek Carbon Capture and Storage Project

Bridge Study (Post Feed) Owner's Engineering Services

Mr. Conway Nelson:

Sargent & Lundy (S&L) is pleased to provide this proposal for Bridge Study Services to support Rainbow Energy Center (REC) post combustion carbon capture plant at the Coal Creek Station located near Underwood North Dakota.

S&L has been involved in numerous first-of-a-kind projects and concepts throughout our 133-year history. Our identity is rooted in a culture of innovation and quality. We have been at the forefront of new design throughout this time. Understanding the engineering required for these new applications is necessary for success. S&L is uniquely qualified to support your technology development based on the following:

- **Industry Leader in CCS** – S&L is an industry leader CCUS and have worked on all phases of CCUS projects including feasibility, Pre-FEL, and FEL studies, government funding applications, pilot-skid design, and detailed design/project implementation. S&L has completed 116 projects with an additional 30 active projects currently on-going, for 85 clients involving 30+ technologies since 2007. This includes projects involving DAC technologies across various stages of development.
- **Strong Technology Experience** – While S&L prides itself on being technology agnostic, we believe strong relationships with technology suppliers is essential to our work. However, S&L has a history of supporting technology suppliers in projects that have advanced their overall technology development including developing pilot-scale projects, supporting scale-up efforts, and developing full-scale FEED studies. Over repeated projects and inquiries with technology suppliers, S&L seeks to develop collaborative working relationships with technology suppliers.
- **Team Qualifications** – S&L has a large number of employees who are actively working on CCS projects, including similar projects in North Dakota. These individuals range in discipline and expertise, and include process/environmental, mechanical, structural, civil, electrical, I&C, designers, construction management, cost estimating, and permitting. As a full-service engineering firm S&L has an array of subject matter experts to rely on for expertise across a wide range of topics.

On behalf of S&L's entire organization, I sincerely appreciate the opportunity to provide this proposal and look forward to providing the high-quality services to you that all of S&L's customers have come to expect. If you have any questions or need additional information regarding this submittal, please do not hesitate to call me at 312 269-2105.

Yours very truly,
Kevin Lauzze

Kevin Lauzze
Senior Vice President & Project Director

Electronic Distribution Only

Rainbow Energy Center
Coal Creek Station
Carbon Capture and Storage Project

Owner's Engineer - CCS

Proposal

April 3, 2024

Revision 1

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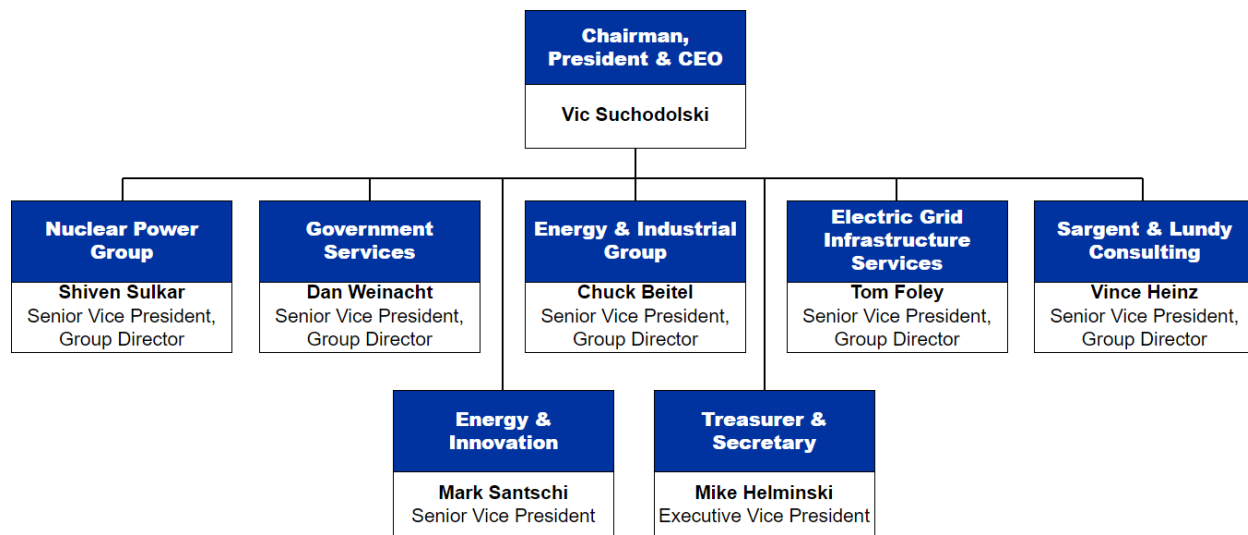
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1. S&L COMPANY OVERVIEW

1.1. ORGANIZATION AND STRUCTURE

S&L's overall company business unit organization is structured to systematically promote the exchange of knowledge and experience throughout the firm. Figure 1-1 presents a high-level view of our overall organization. This organizational approach enables our engineers, designers, and technical specialists to keep current in their respective areas of expertise and to provide value-added services and innovative solutions for every assignment undertaken. S&L is 100% owned by the members of the company, and all of the S&L officers are actively and solely engaged in the management and day-to-day operation of the company.

Figure 1-1. S&L Overall Organization



We are not affiliated with any equipment suppliers, constructors, or plant operators. This independence enables S&L to provide our services to our clients free of bias, based solely on sound engineering principles and focused on the good of our customers. Our more than 130 years of continuous experience executing power projects is a testament to our ability to put our clients' interests first, as well as being a firm foundation for our understanding of how plant constructability, equipment and system performance and efficiencies, materials, emissions control technologies, and designs influence long-term operations and maintenance.

Chairman, President and Chief Executive Officer, Vic Suchodolski, provides overall direction to company policy. He is responsible for the long-range planning, administration, and management of our business objectives. This includes guiding and directing marketing and business development efforts to ensure that the firm's current activities support its overall objectives.

Sargent & Lundy's business group leaders and highlights of the respective group's primary areas of focus are briefly described below. Each business group is directed and managed by personnel who have demonstrated leadership, project management, and technical abilities, while consistently satisfying client needs. This dynamic organizational arrangement provides the flexibility to readily allocate and transition key personnel in divisions and groups, as needed.

S&L's business group leaders and highlights of the respective group's primary areas of focus are briefly described below. Each business group is directed and managed by personnel who have demonstrated leadership, project management, and technical abilities, while consistently satisfying client needs. This dynamic organizational arrangement provides the flexibility to readily allocate and transition key personnel in divisions and groups, as needed.

The work proposed here will be completed in our Energy & Industrial Group.

1.1.1. Technical Support Divisions

S&L's business groups are supported by various technical divisions, some organized separately within the business group dedicated to facility development and operating service support. This approach helps to align staff skills to the clients being served by the respective business groups.

Table 1-1. Technical Support

Division/Section	Function
Mechanical Engineering and Design	Mechanical engineering analysis and design for facility mechanical systems.
Electrical and Controls Engineering and Design	Electrical project engineering activities, including electrical design and analysis activities.
Instrumentation & Controls Engineering	Engineering and design of instrumentation control and systems for major steam-electric generating plants.
Structural / Civil / Architectural / Geotechnical Engineering and Design	Structural, civil, architectural, and geotechnical engineering services support for fossil or nuclear operating units or for the development new units.
Piping Analysis and Mechanical Design	Engineering, analysis, and design services associated with piping, piping supports, and related mechanical engineering interface.
Material Handling	Engineering and design for delivery, unloading, storage, reclaiming and conveying of solid fuels and bulk chemicals; and ash handling collection and transport systems.
Plant Performance	Heat and mass balances, cycle optimization, and plant and equipment performance testing.
Plant and Building Services	Engineering and design for fire protection, HVAC, plumbing and architectural services.

Division/Section	Function
Environmental, Permitting, and Regulatory Services	Engineering analysis for air quality control and water quality control technologies, as well as environmental assessments, compliance planning, licensing, and permitting services.
Electrical Analytical	Generation and transmission systems planning studies, plant electrical system design studies, and other analytical work related to the evaluation of electrical system design, performance, and operation.
Materials Engineering	Recommends appropriate materials of construction to suit the service environment and provides quality control surveillance and testing services related to equipment and materials suppliers.
Construction Management	Manages construction activities for new units and retrofit projects, including startup and testing programs.
Transmission and Distribution	Engineering and design services to support the development, maintenance, and upgrading of transmission lines and substations.
O&M Support Services	Prepares operating procedures and training and analyzes overall unit performance improvements.
Procurement	Supports projects with equipment and materials procurement services, including specification preparation, supplier negotiation, expediting and similar services.
Planning and Scheduling	Develops and maintains project plans and schedules.
Cost Information	Prepares cost estimates of equipment, labor, and materials to support projects.

1.2. RESOURCE AVAILABILITY AND LOCATIONS

S&L was formed based on the technical strengths of its founders, with roots dating all the way back to Thomas Edison. Since then, generations of our engineers and technical experts have been leaders in shaping the power and energy industry in the United States and around the world. Our industry leadership continues to this day and includes the following contributions:

- More than 330 members on industry code committees and industry compliance organizations, e.g., ASME, ACI, AISC, ANS, ASTM, IEEE, ISA, and NFPA, among others.
- Leadership as Chair, Vice Chair, or Officer on numerous of the above code committees. For example, a Sargent & Lundy staff member was appointed senior vice president, an officer position, of the ASME Standards and Certification Sector by the ASME Board of Governors. The position of senior vice president of this sector chairs the Council on Standards & Certification. It governs the development and maintenance of all ASME codes, standards, and guides as well as ASME certification activities.
- Continuous investment and leadership participation in global industry conferences and seminars.
- Annual engagements with the Electric Power Research Institute (EPRI) on a paid basis to facilitate the development of market studies, representative costs, and industry trends.
- Industry recognition as a leader in state-of-the-art technical training.

S&L's interdisciplinary professional workforce continually diversifies to evolve in parallel with the changing needs of the global power, energy, and oil & gas industries. Our global office infrastructure and resources

enable us to staff projects quickly and with the appropriate mix of expertise and experience for all assignments.

As noted above, S&L serves the worldwide energy and industrial markets from our headquarters in Chicago, Illinois, from satellite offices across the United States, as well as from our international and joint venture offices in Canada, India, Kingdom of Saudi Arabia, South Korea, and the United Arab Emirates.

2. S&L APPROACH

2.1. PROJECT MANAGEMENT AND CONTROLS

Sargent & Lundy's business philosophy includes a foundation built on strong project management expertise, processes, and tools for effective project controls. Our project teams are led by Project Managers who have extensive experience managing projects of varying degrees of complexity. The technical and management skills of our Project Managers are among the principal reasons that S&L project teams consistently achieve high quality deliverables, budgetary conformance, and schedule adherence. Fundamental to our program is our alignment with the goals and objectives of the Project Management Institute (PMI) and our utilization of their Project Management Body of Knowledge (PMBOK®) which we use as part of our project management training.

S&L manages project schedules and costs using tools and reports tailored to the scope, size, complexity, functional needs and/or other special requirements that have been identified for the project. The project controls program implemented by S&L ensures that the needs of external project stakeholder are considered and set up to support an appropriate progress update and reporting frequency. This reporting cadence ensures that required data is delivered to the appropriate stakeholders when needed.

2.2. QUALITY

Sargent & Lundy has always been committed to providing quality engineering and consulting services. In 1995, we took the proactive step of establishing a quality management system (QMS based on ISO 9001 requirements (the figure below shows our current ISO certificate). The foundation of the QMS is the SL-QAP, Quality Policy, and Program Plan, which includes a set of implementing standard operating procedures or SOPs. Adherence to SL-QAP and SOPs is mandatory for all work companywide.

The Sargent & Lundy QUALITY POLICY, as defined in SL-QAP, is to:

Consistently provide quality work that meets or exceeds customer requirements

Enable our employees to achieve excellence in the industry

Continually improve the effectiveness of the quality management system

For nuclear safety-related work, compliance with our nuclear quality assurance (QA) program, SL-TR-1A, is also required. Sargent & Lundy's Nuclear Quality Assurance Program is maintained as a Topical Report as approved by the U.S. Nuclear Regulatory Commission.

Sargent & Lundy has an established Quality Council that focuses on our quality system and on quality improvement activities. The Quality Council, which has been meeting regularly since 1997, serves as a Board of Directors for quality matters. The Quality Council highlights issues that need top management attention, facilitates knowledge sharing across business groups, monitors selected improvement activities

with companywide impact, and fulfills procedurally/programmatically required roles, such as annual management reviews and trending of our Performance Improvement Process, as described below.

The Quality Council is led by our Chairman and CEO, along with the Director of Quality and senior personnel drawn from all of our functional and business groups.

Our approach toward quality is comprehensive and systematic. Certain elements of Sargent & Lundy's QMS are transparent to our customers, but integral to our approach to their work. These elements address sustained technical excellence through our System of Processes, knowledge sharing via our Communities of Practice (COPs), continual improvement through our Performance Improvement Process, and a defined system of checks and balances, including rigorous oversight through companywide audits.

Additionally, our processes call for independent and interdisciplinary design reviews of critical systems. Unbiased subject-matter specialists, i.e., not an assigned team member, critique the design work of the dedicated project team members. This is done by scrutinizing and challenging assumptions, technical judgment, and conclusions reached during the engineering and design phases. This ensures that our expertise and experience are leveraged on all projects and built into every project schedule. The results are also documented, typically via meeting notes, with recommended action items clearly identified.

All Sargent & Lundy projects and processes are subject to audit by a certified Lead Auditor. Audits typically include technical specialists for a more robust evaluation that goes beyond compliance with procedural requirements.

Our QMS has regularly been certified as meeting the requirements of ISO 9001:2015 by Perry Johnson Registrars, an internationally recognized ISO 9001 registrar. The most recent such audit reconfirmed that the execution of our QMS continues to meet or exceed the requirements of the ISO standard.



Sargent & Lundy's QMS promotes a customer focus to our work activities. Our project directors are specifically charged with establishing and maintaining effective working relationships between their respective clients and Sargent & Lundy. To that end, we encourage the active involvement and input of our clients over the life of the project. For example, our procedures emphasize the importance of sharing example deliverables to end-users, including engineering, systems engineering, installers, operations, and maintenance personnel. This proactive approach enables all stakeholders to have clear expectations early on as to the quality of the deliverables provided at the conclusion of a project. Our emphasis on working collaboratively with the client during project planning, execution, and close-out, has proven effective at identifying and resolving problems quickly.

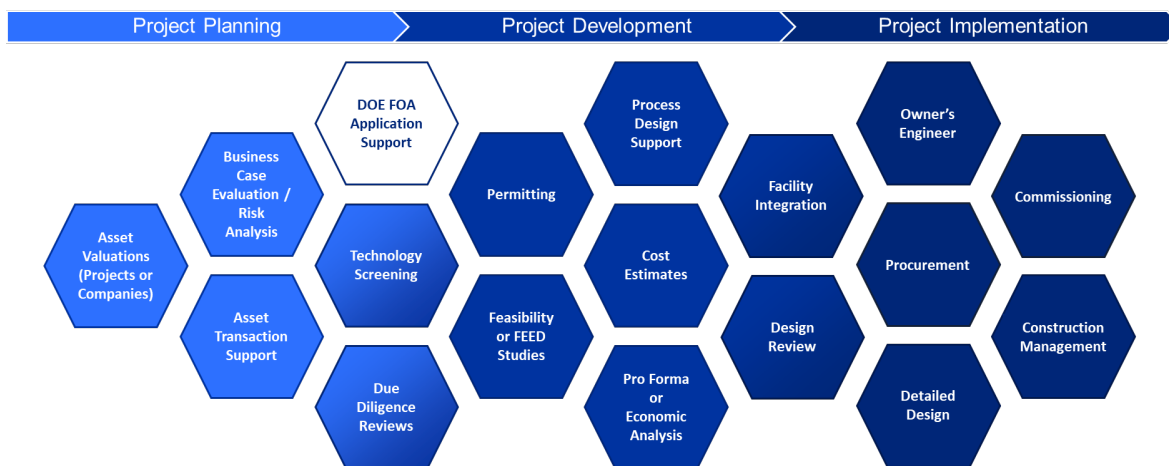
Quality is embedded in S&L's approach to work and is synonymous with the technical excellence we apply to our clients' projects and the high value we place on meeting and exceeding their expectations.

3. RELEVANT EXPERIENCE

Sargent & Lundy is one of the longest-standing and most experienced full-service architect engineering firms in the world. Founded in 1891, the firm is a global leader in power and energy with expertise in grid modernization, renewable energy, energy storage, nuclear power, and fossil-fueled power plants. S&L delivers comprehensive project services—from consulting, planning and design, permitting, and implementation to construction management, commissioning, and operations/maintenance—with an emphasis on quality and safety. The firm serves public- and private-sector clients in power and energy, oil & gas, government, industrial, mining, and other heavy industries.

S&L offers various scopes and services throughout the range of project development, as shown in Figure 3-1, including, but not limited to, technology screenings, due diligence support, business case development, feasibility studies, process oversight, detailed design, and Owner's Engineering reviews.

Figure 3-1. Sargent & Lundy Capabilities



S&L prides itself on being technology agnostic and we approach every project from a standpoint of identifying the best technology or supplier for the specific application. While we remain technology agnostic, we have worked with a wide range of technology suppliers within the CCUS space and maintain on-going discussions and relationships with them to ensure we remain current on the latest industry offerings, experience, costs, and performance.

In addition to S&L's experience with project development phases ranging from feasibility through FEED, S&L has also had significant experience working with technology developers scaling up and designing pilot skids of their technologies. As such, S&L is well aware of the potential scope, schedule, and cost risks associated with these types of projects.

S&L has been an industry leader since our founding and has significant first-of-a-kind experience and is familiar with the potential scope, schedule, cost, and performance risks that may arise in these types of new application projects.

3.1. SIMILAR EXPERIENCE

S&L is currently supporting multiple FEED studies in a multitude of roles including Owner's Engineer, OSBL/integration engineer, and supporting the technology vendors in the ISBL design. Specific example projects are listed below and our full experience list is included as Exhibit 1.

Project Tundra – Owner's Engineer

S&L has been serving as the OE for Project Tundra since 2022. Our role has included being a 'typical' OE in which S&L managed weekly meetings, maintained Action Item lists, coordinated key review meetings with the owner, the technology supplier, and the EPC. We also served as the document review coordinator which entailed managing the drawing review process, including consolidation of all comments (including those from the Owner and other stakeholders). S&L also oversaw multiple on-site testing campaigns, including flue gas testing and WESP testing. S&L has done a number of FEED level design during this time as well, including steam extraction, water treatment, and wastewater disposal. Finally, S&L is currently serving as the FEED study engineer for the CO₂ pipeline and monitoring and controls system.

Gerald Gentleman Station CCS Project – Owner's Engineer

S&L is currently serving as the OE for a carbon capture FEED at Gerald Gentleman Station utilizing Baker Hughes Chilled Ammonia process. The scope is similar to the scope description in Project Tundra with S&L performing more BOP studies such as a steam sourcing study and cooling study. This project kicked off in Q3 2023 and is expected to be completed by Q4 2024.

Heidelberg Materials CCS FEED – FEED Engineer

S&L is currently working with MHI on the Heidelberg Materials Mitchell Cement Plant CCS FEED study. S&L's role is full OSBL and integration engineer and we are serving as the OE for the MHI process deliverables. Kiewit is also working on this project doing constructability reviews and cost estimating.

Prairie State CCS FEED – OSBL Conceptual Design and Owner's Engineer

S&L served as the preliminary FEED engineer and eventually the Owner's Engineer for the full FEED. This FEED was done on the 820 MW Unit 2 and included MHI as the technology provider and Kiewit as the EPC. S&L's scope included the initial design basis document, all of the up front studies (steam and electric sourcing, cooling system design, and water treatment studies). As we transitioned to the OE role, we

participated in weekly model reviews, GA and P&ID reviews, the HAZOP review, and served as the document review management system.

Project Diamond Vault – Owner's Engineer and FEED Study Conceptual Design

S&L has been serving as the Owner's Engineer and FEED Study Conceptual Design Engineer for a 635 MW solid fuel unit since 2021. S&L's support began with a Techno-Economic Assessment of the project before a multi-phase DOE-funded FEED study was initiated in 2022. In the first phase of the FEED study, S&L executed parallel Feasibility Studies with two amine carbon capture technology suppliers and provided the preliminary OSBL design to provide a comparison of capabilities and total estimated project costs. In the second phase, a single technology supplier was selected for the Pre-FEED study. S&L sub-contracted the technology supplier to provide their design and cost information and S&L was responsible for review of all their submittals. S&L completed the OSBL Pre-FEED design including engineering studies for steam supply, electrical supply, cooling water supply, wastewater treatment, emissions estimates, process hazards, and constructability review. S&L also provided a preliminary design package and cost estimate for the CO₂ pipeline to the sequestration wells. The Pre-FEED phase was completed with Class 3 cost estimate and a summary report to the DOE. For the final phase, S&L will be serving as the coordinator of the FEED study which will be executed with the technology supplier to refine their design and an EPC contractor that will result in a Class 2 cost estimate and project execution plan.

3.2. CCUS EXPERIENCE

S&L has extensive experience conducting technical evaluations for CO₂ capture projects over the last decade, including feasibility, FEL, Pre-FEED, and FEED studies for clients which included preliminary system engineering, project layout, preliminary design, and cost estimates. Among the most notable FEED studies conducted by S&L was the Petra Nova Carbon Capture Project, which was awarded the Best Project of Merit award from Engineering News Record (ENR). S&L's work on the Petra Nova project included multiple FEED studies, Owner's Engineer services during project implementation, and detailed design of the 240 MW equivalent (MWe) slipstream carbon capture unit onto NRG's W.A. Parish Unit 8.

Figure 3-2. CCUS Experience Overview

Of the 146 projects that S&L has completed or is currently supporting in the CCS space, this includes 66 feasibility studies, 6 Pre-FEED studies, and 26 FEED studies. For all of these projects/studies S&L was the CCS system integrator, providing balance of plant engineering and integration into the existing facilities. For many of these projects, S&L also provided inside the boundary limit (ISBL) scope for the technology vendor. Our remaining 48 projects, have included pilot skid development and design, design of CO₂ pipelines, detailed design support, and miscellaneous project development support including leading FOA applications. Our CCS Experience List is provided in Exhibit 1.

With respect to CCS, S&L has significant experience with the capture technologies and integration of those technologies into new and existing facilities. As a project integrator, S&L works with technology vendors to provide a complete and integrated system design. In recent years our role on those projects has moved beyond balance of plant and integration engineering, and for many of our projects we have worked closely to review and support process engineering and provide design and engineering within the boundary limits of the process or technology island.

S&L also has experience with the compression and transportation portion of the CCS process. Initial compression typically occurs on-site as part of the capture process and has been a part of all of the capture projects that S&L has completed. In addition, S&L has experience with natural gas compressor stations and pipeline design as part of our Oil and Gas work. Building on this experience, S&L just completed detailed design of the Dakota Carbon Pipeline, which began construction in October 2021 and is scheduled to begin operation in the second half of 2023.

4. PROJECT OVERVIEW

Rainbow Energy Center (REC) is planning to install a post combustion carbon capture plant at the Coal Creek Station located near Underwood North Dakota. Once operational, this facility will capture and sequester approximately 95% or 8.5 million tonnes of the CO₂ that is emitted by the 1151 MW coal fired power station.

REC is currently in the FEED study stage of development which is planned to be complete by March 31, 2024. The project is currently divided into ISBL and OSBL areas. The ISBL portion of the FEED is being supported by MHI and Kiewit, and the OSBL portion of the FFED by Burns & McDonnell.

REC has issued an RFP for Owner's Engineering Services to assist with the completion of a Bridge Study, to finalize the scope of work, cost, and schedule.

5. SCOPE OF WORK

5.1. GENERAL

The Bridge Study scope will include reviewing the FEED Study deliverables, including: recent process design decisions made, FEED deliverables (such as P&IDs and general arrangements), and the FEED cost estimate. Additional scope includes identifying optimization opportunities, participating in Bridge HAZOP and RAM, supporting REC in selecting an EPC BOP Contractor, and preparing specifications for long lead items.

At the start of the Bridge study, the S&L project team will meet with REC to review and discuss the available documents and deliverables developed for the project to date. The goal of this review is to align our understanding of the project status, current design, and REC's goals for the project. P&IDs, General Arrangements, project design criteria, projects lists, and quantities/Bills of Materials are items that are generally developed during FEED and will be useful in reviewing the FEED cost estimate.

REC has provided a list of documents that require detailed structural, civil, electrical and I&C review. Of the 253 capture island and 118 BOP documents listed in the RFP. These documents will be reviewed, taking into account the Project Design criteria including required codes and project specific requirements, in addition to reviewing these against acceptable industry design practice.

5.2. PROCESS DESIGN CHANGES/FINALIZATION

REC expects that there will be process design changes to the Carbon Capture process, resulting from flue gas characterization activities completed last month. One of the possible changes being the addition of a wet electrostatic precipitator to the equipment line-up. S&L has worked on several projects where MHI has been the system designer and is aware of the system changes that have typically been incorporated due to the specific REC flue gas conditions. S&L knows that in an effort to control project costs, it is imperative to review any changes proposed with the system designer to understand the drivers while prioritizing the goal to minimize cost as well as the effect on overall plant arrangement and system pressure drop.

5.3. STUDIES

As Owners Engineer S&L would participate in a RAM study (to be led by others), that will be used to finalize the equipment line-up, including equipment redundancy. We understand that the FEED system design includes a high level of redundancy (an N+1 design). Based on our experience, this level of redundancy can add significant cost to a project and is not recommended. A high level review of equipment availability can be achieved, with a less conservative level of redundancy, and S&L will use our experience on past FEED studies to drive towards the most cost effective system design that still provides a high degree of availability.

S&L will participate in a Bridge Study HAZOP review to analyze the impact of system changes made during the Bridge Study. It is assumed that like the RAM study, this will be led by others. Please note that S&L does have the capability to facilitate a HAZOP review with a non-project team member. Facilitation would include pre-meeting preparation as well as a post meeting report including recommendations.

5.4. DESIGN REVIEW

S&L will review the FEED design to ensure that it meets the existing project design requirements as well as industry standards. As part of the design review, we will also identify optimization opportunities that may be viable. It is understood that most of the mechanical design has gone through a detailed review and those deliverables will only require a high level review. The remaining deliverables, primarily structural and electrical, listed in Exhibit A of the RFP will require a more detailed review.

5.5. COST ESTIMATE REVIEW

S&L will review the complete (ISBL and OSBL) Class 3 FEED cost estimates, focusing on opportunities to identify potential cost savings by optimizing system design, including items such as additional modularization or other items that may reduce construction or operating costs.

The RFP mentioned that the Cost Review may include a parallel estimate. The cost of a parallel estimate is currently excluded from this proposal as this would depend on REC's desired end goal. This could be a large effort depending on the scope and goal of the parallel estimate.

5.6. CONSTRUCTABILITY REVIEW

S&L will review the existing constructability review and will highlight areas where we believe the layout or execution of the project could be improved.

5.7. PROCUREMENT SUPPORT

For the balance of plant activities, REC intends to go out for competitive bid to select an EPC Partner to engineer, procure, and construct the balance of plant facilities including OSBL scope such as ductwork, dampers, steam supply, closed cooling system, electrical supply, and control integration.

As Owner's Engineer S&L will assist REC in all phases of the OSBL EPC Contractor selection including bid package preparation and bid evaluations. This will be done by reviewing the existing Division of Responsibility and ensuring that the scope split between the ISBL and OSBL is sensible. In addition, S&L has found during many of our recent FEED studies that the scope split should include a third "BOP area" which includes any design work that is done inside the existing plant. This work often comes with a high risk premium from the OSBL EPC entity and is typically work the plant may prefer contractors more familiar with their facility to perform. This can be further discussed with REC after award.

In addition to the EPC procurement support, S&L will review the current long lead equipment study/list. We will work with REC to develop specifications for any items that need to be procured outside of the EPC and based on our recent experience we would expect this list to include major electrical equipment and potentially the CO₂ compressor.

5.8. GENERAL SUPPORT

As Owner's Engineer S&L will support REC with overall project execution and schedule planning. This includes running weekly meetings, maintaining a weekly action item list, and engaging our project execution group (including our project controls and construction personnel) to review the schedules and execution plans put in place by the current FEED study team.

6. PROJECT EXECUTION

6.1. PROJECT MANAGEMENT

6.1.1. Project Management Plan

A project work plan will be prepared to support the Bridge Study execution of the services provided by S&L. The plan will cover project and engineering management, project communications and interface, project organization, project controls management, and document control.

6.1.2. Project Communication

S&L will prepare a project correspondence and communication plan as part of the project management plan. The communication plan will identify the correspondence and distribution protocol between the project organizations. The plan will also establish correspondence numbering procedures, methods for transmitting documents, and documentation requirements for meeting notes and action items.

A decision log will be maintained throughout the project to document key assumptions, decision points, and items requiring follow-up in future project phases.

6.1.3. Document Management and Sharing

S&L can utilize the existing document collaboration site if desired, or we can utilize our internal Egnyte software system for this project if desired at no additional cost to REC.

6.2. BRIDGE STUDY PROJECT SCHEDULE

Based on discussion with REC, it is expected the bridge study will be broken into two phases. Phase 1 will include initial review of the open book cost estimate, flue gas testing and characterization, and process design finalization including and process design modifications required by the flue gas testing. Phase 2 of the bridging study will include updating and reviewing FEED documents, reviewing the updated cost estimates, procurement planning, and creating the EPC specifications. Phase 1 is expected to occur between April and October 2024 and Phase 2 is expected to occur from October 2024 to August 2025.

6.3. PROJECT TEAM

S&L strives to maintain long-term relationships with our clients. To that end, S&L's proven staffing philosophy is to assign personnel to a project team for the life of the project. This commitment ensures both continuity and efficiency because of the team members' in-depth knowledge of the project's progress and of the other team members' activities. All projects S&L undertakes are led by a designated project director

and project manager, with support provided by a core team of lead personnel.. Nearly all team members included on this org chart have been part of the Project Tundra OE team.

Additional staff will be assigned to support this project, as needed. S&L's project team commitment extends to dedicating specific individuals in support areas as well, including subject matter experts. Our multi-disciplined project team staffing approach will ensure that S&L has the appropriate personnel to provide high-quality, timely services.

7. COMMERCIAL INFORMATION

7.1. BRIDGE STUDY PRICING

S&L typically estimates OE work on a level of effort basis. The table below identifies the key positions and the expected workload of each position. The work will be done on a T&M basis, with mutually agreeable rates, so REC will only be charged for the time S&L works on the project. Based on the table below, our total estimate to support this work is \$1,090,000. This includes 15 domestic person trips, which may include Coal Creek Station, the EERC, MHI or EPC offices. This cost assumes no trips to Japan are necessary.

Phase 1 is estimated to cost \$405,000 while Phase 2 is estimated to cost \$685,000

Position	Phase 1		Phase 2 (thru Aug 15 2025)			
	Q2 2024	Q3 2024	Q4 2024	Q1 2025	Q2 2025	Q3 2025
PD	5%	5%	5%	5%	5%	5%
PM	40%	35%	25%	35%	35%	15%
Process/Env Lead	35%	35%	15%	25%	15%	5%
Task Coordinator	30%	30%	15%	30%	30%	15%
Mech Eng	15%	15%	10%	15%	15%	5%
Struct Eng	20%	20%	10%	20%	15%	5%
Elec Eng	20%	20%	10%	20%	15%	5%
I&C Eng	10%	10%	5%	10%	10%	5%
Cost Estimating	10%	15%	5%	10%	15%	5%
Constructability	5%	5%	10%	15%	5%	5%
Misc SMEs	20%	20%	10%	20%	10%	5%

7.2. CONTRACT TERMS

A consulting agreement is currently being negotiated, and this work will be performed under that final agreement.



April 4, 2024

Mr. Conway Nelson
Director of Carbon Management
Rainbow Energy Center
918 East Divide Avenue
Bismarck, ND 58504

Dear Mr. Nelson:

Subject: International CCS Knowledge Centre Proposal for Bridge Study at Coal Creek Station

On behalf of the International CCS Knowledge Centre (the "Knowledge Centre"), we are pleased to continue our support to Rainbow Energy Centre ("REC") in its Bridge Study CCS Project for the North Dakota Industrial Commission (NDIC) Lignite Research Program (LRP). The Knowledge Centre has worked with REC through its front-end engineering design (FEED) study that has led to this proposed effort. The Knowledge Centre will use this experience to continue our support of the proposed project, of which a proposed outline follows.

Bridge Study Phase 1 Tasks

Task 1 – Cost Estimate Review and Validation

Review the carbon capture plant (CCP) and the balance of plant (BOP) capital and operating cost estimates.

Task 2 – Flue Gas Characterization

Review procedures for flue gas stack testing and lab studies. Flue gas constituents (i.e. metals, NO₂, particulate matter) will accelerate amine degradation and/or equipment fouling. It is very important that the testing and studies are performed accurately to ensure correct data is attained.

Task 3 – Process Design Finalization

Expert analysis of the results of the flue gas characterization providing guidance to REC of required process modifications. The Knowledge Centre will also support:

- 1) the review of CCP and BOP documents
- 2) optimization of thermal integration from Coal Creek Station

ccsknowledge.com

306.565.5669

198 - 10 Research Drive

Regina, SK S4S 7J7 Canada

Mr. Nelson
April 4, 2024
Page 2

- 3) review of the reliability, availability, maintainability (RAM) study completed by a third party to determine the correct balance of minimizing equipment costs while ensuring reliable operation of the CCP
- 4) analysis of the benefits and cost impact of a Wet Electrostatic Precipitator (WESP) to reduce flue gas constituents thereby reducing the risk of amine degradation
- 5) a hazard and operability (HAZOP) analysis of the CCP and BOP to ensure that the overall design will not cause operability problems to Coal Creek Station nor the CCP

Bridge Study Phase 2 Tasks

Task 4 – Cost Estimate Finalization

Review the updated capital and operating cost estimates for both the CCP and BOP.

Task 5 – Project Execution Preparation

Review the engineering, procurement, and supply (EPC) contracts, including separate major supply contracts.

Task 6 – Permitting Strategy Development

Review the necessary permits required to construct and operate the CCP. Examples of these permits include construction, air emissions, waste disposal, and water usage.

Task 7 – Project Management and Reporting

Review the cost, scope, and schedule of Tasks 4-6 (Knowledge Centre tasks only) by scheduling regular meetings and updating REC of both progress and cost.

Bridge Study Estimated Cost

The total estimated cost for both Phase 1 and Phase 2 scopes of work is **\$403,014** USD. The table below illustrates the estimated cost of each scope of work and schedule.

Mr. Nelson
April 4, 2024
Page 3

	Estimated Cost USD	Completion Date
Bridge Study Phase 1	\$258,811	November 30 th , 2024
Bridge Study Phase 2	\$144,203	October 31 st , 2025

We look forward to the opportunity to continue our collaboration with REC on this project. If you have any questions or need any additional information, please do not hesitate to contact me. I may be reached at ranwar@ccsknowledge.com.

Sincerely,



Rafay Anwar
Vice President, Project Development & Technical Services

ccsknowledge.com

306.565.5669
198 - 10 Research Drive
Regina, SK S4S 7J7 Canada

APPENDIX B

LETTERS OF COMMITMENT



918 E Divide Ave.
Bismarck, North Dakota 58501
701.315.8181
rainbowenergycenter.com

April 1, 2024

Mr. Reice Haase
Deputy Executive Director
ATTN: Lignite Research Program
North Dakota Industrial Commission
600 East Boulevard Avenue, State Capitol, 14th Floor
Bismarck, ND 58505-0840

Dear Mr. Haase:

Subject: Rainbow Energy Center Proposal No. REC001 Entitled "Bridge Study for CCS at Coal Creek Station"

Thank you for the opportunity to present the grant proposal for the Bridge Study for CCS at Coal Creek Station. Your support of this study is critical to the final steps prior to construction for post-combustion capture and storage at Coal Creek Station.

Rainbow Energy Center remains focused on providing baseload energy from Coal Creek Station with carbon capture and incremental generation from renewables to fully utilize the capacity of Nexus Line, our high-voltage direct current (HVDC) transmission system. The execution and implementation of carbon capture and storage is a critical part of our vision to extend the longevity of Coal Creek Station and is an important step toward Governor Doug Burgum's goal for the state to reach carbon neutrality by 2030.

As North Dakota's largest power plant, Coal Creek Station supports over 700 careers at the plant, Falkirk Mine, and other supporting industries. Implementing new technologies preserves existing careers, as well as creates new careers, and serves as an economic backbone for the area communities, county, and state. In support of Coal Creek Station and these communities, Rainbow Energy Center is committing a total of \$2,500,000 in cash and in-kind funding to this proposed Bridge Study project. Rainbow Energy Center verifies that this committed funding is not being shown as cost share to any other state programs.

We believe CCS at Coal Creek Station meets the Lignite Research Program's mission to deploy large-scale commercial technologies that produce reliable, dispatchable, low-carbon electricity while also sustaining jobs, tax revenue, and the economic vitality of the state. Rainbow Energy Center is committed to delivering a carbon capture project that serves as a showcase for future projects around the world. Thank you for your consideration of support for this application.

Kind regards,

A handwritten signature in blue ink, appearing to read "Jeffrey Jonson".

Jeffrey Jonson
President,
Rainbow Energy Center



Energy & Environmental Research Center

15 North 23rd Street, Stop 9018 • Grand Forks, ND 58202-9018 • P. 701.777.5000 • F. 701.777.5181
www.undeerc.org

March 26, 2024

Mr. Conway Nelson
Rainbow Energy Center
918 East Divide Avenue
Bismark, ND 58501

Dear Mr. Nelson:

Subject: Letter of Commitment for Rainbow Energy Center Proposal Entitled “Bridge Study for CCS at Coal Creek Station”

The Energy & Environmental Research Center (EERC) would like to express our support and commitment for the Bridge Study for CCS at Coal Creek Station project for which a proposal is being submitted to the North Dakota Industrial Commission.

The EERC is recognized as one of the world’s leading developers of cleaner, more efficient energy to power the world and environmental technologies to protect and clean our air, water, and soil. We have 65 years of energy research experience, multidisciplinary staff, and state-of-the-art facilities and equipment.

The EERC is committed to making this project a success and our participation in the Coal Creek front-end engineering and design study as well as the redundancy study provides us with project-specific knowledge that we will use to support the proposed bridge study.

We appreciate being considered for this project and look forward to participating with Coal Creek staff and the rest of the project team. If you have any questions or need any additional information, please contact me by phone at (701) 777-5355 or by email cgorecki@undeerc.org.

Sincerely,

A handwritten signature in blue ink, appearing to read "Charles D. Gorecki", written over a white background.

Charles D. Gorecki
CEO

CDG/rlo



March 29, 2024

Mr. Conway Nelson
Rainbow Energy Center
918 E Divide Avenue
Bismark, ND 58501

Dear Mr. Nelson:

Subject: Letter of Commitment for Rainbow Energy Center Proposal Entitled "Bridge Study for CCS at Coal Creek Station"

On behalf of Burns & McDonnell, this letter expresses our support and commitment for the Bridge Study for CCS at Coal Creek Station project for which a proposal is being submitted to the North Dakota Industrial Commission.

Burns & McDonnell is a fully integrated engineering, architecture, construction, environmental, and consulting firm with a multidisciplinary staff of more than 14,000 professionals. Founded in 1898, our singular mission has been to make our clients successful. Being 100 percent employee-owned means that everyone has an ownership stake in the success of our clients, and all team members are driven to find great solutions.

Burns & McDonnell is committed to making this project a success, and our participation in the Coal Creek front-end engineering and design study as well as the redundancy study provides us with project-specific knowledge that we will use to support the proposed project.

We appreciate being considered for this project and look forward to participating with Coal Creek staff and the rest of the project team. If you have any questions or need any additional information, please contact Aaron Bennett or me.

Sincerely,

A handwritten signature in blue ink, reading "Patrisha M. Scroggin-Wicker".

Patrisha M. Scroggin-Wicker

Decarbonization Director
Burns & McDonnell



Engineered Systems Division
•20 Greenway Plaza Suite 600 Houston, TX 77046 Tel: (713)-351-6400 Fax: (713)-351-6450•

March 26th, 2024

Mr. Conway Nelson
Rainbow Energy Center
918 E Divide Avenue
Bismark, ND 58501

Dear Mr. Nelson:

Subject: Letter of Commitment for Rainbow Energy Center Proposal Entitled “Bridge Study for CCS at Coal Creek Station”

Mitsubishi Heavy Industries America, Inc. (MHIA) is pleased to commit its support to the Bridge Study for CCS at Coal Creek Station project for which a proposal is being submitted to the North Dakota Industrial Commission.

MHIA is a wholly owned subsidiary of Mitsubishi Heavy Industries, Ltd. (MHI) and together delivered the Petra Nova Project, the world’s largest post combustion CO₂ capture system (4776 tonnes/day of CO₂ captured), including overall engineering, design, and procurement for all major equipment, operator training, and commissioning support.

MHI has delivered 13 commercial plants for coal, natural gas, and oil combustion exhaust gases and holds an outstanding market share in the world in the field of post combustion CO₂ capture, leading the world in commercially proven post combustion CO₂ capture knowledge base. The CO₂ capture system proposed for this project is based on improvements to MHI’s proprietary Kansai Mitsubishi Carbon Dioxide Recovery Process (KM CDR Process™), including the use of MHI’s proprietary solvent.

MHI is committed to making this project a success, and our participation in the Coal Creek front-end engineering and design study as well as the redundancy study provides us with project-specific knowledge that we will use to support the proposed project.

We appreciate being considered for this project and look forward to participating with Coal Creek staff and the rest of the project team. If you have any questions or need any additional information, please contact me.

Sincerely,

Tim Thomas

Tim Thomas
Senior Vice President
Mitsubishi Heavy Industries America, Inc.
Engineered Systems Division (ESD)
Direct: (512)954-1964/ email: timothy.thomas@mhia.com



Kevin Lauzze
Senior Vice President
(312) 269-2105
kevin.c.lauzze@sargentlundy.com

March 28, 2024

Mr. Conway Nelson
Rainbow Energy Center
918 E Divide Avenue
Bismark, ND 58501

Dear Mr. Nelson:

Subject: Letter of Commitment for Rainbow Energy Center Proposal Entitled “Bridge Study for CCS at Coal Creek Station”

Sargent & Lundy (S&L) is pleased to commit its support to the Bridge Study for CCS at Coal Creek Station project for which a proposal is being submitted to the North Dakota Industrial Commission.

S&L is a global leader in power and energy with expertise in grid modernization, renewable energy, energy storage, nuclear power, and fossil fuels. Our top-ranked design firm delivers comprehensive project services from consulting, design, and implementation to construction management, commissioning, and operations/maintenance.

As an industry leader S&L has remained at the forefront of innovation and technology advancements that support the energy industry, including carbon capture. S&L has been conducting preliminary studies, technical evaluations and detailed balance of plant engineering for multiple carbon capture projects in recent years.

S&L is committed to making this project a success. We appreciate being considered and look forward to participating with Coal Creek staff and the rest of the project team. If you have any questions or need any additional information, please contact me.

Sincerely,

A handwritten signature in black ink that reads "Kevin Lauzze". The signature is written in a cursive style with a large, looped initial 'K'.

Kevin Lauzze
Senior Vice President



March 26, 2024

Mr. Conway Nelson
Director of Carbon Management
Rainbow Energy Center
918 E Divide Avenue
Bismark, ND 58501

Dear Mr. Nelson,

RE: Letter of Support for Rainbow Energy Center Proposal Entitled “Bridge Study for CCS at Coal Creek Station”

On behalf of the International CCS Knowledge Centre (the “Knowledge Centre”), we are pleased to submit this letter of support for the Bridge Study for CCS at Coal Creek Station project for which a proposal is being submitted to the North Dakota Industrial Commission.

The Knowledge Centre is dedicated to advancing large-scale CCS projects as a critical means of reducing greenhouse gas emissions and supporting the world’s ambitious climate goals. Our mission is to accelerate the deployment of CCS worldwide by allowing the learnings acquired at the Boundary Dam 3 CCS facility (in Saskatchewan) to be shared broadly across industries and around the world. We undertake projects to help inform stakeholders regarding “real world” considerations in the use of CCS to de-risk projects and move them towards a final investment decision. In addition to our deep technical capabilities, the Knowledge Centre team also actively engages financiers and decision makers to ensure high-level information on CCS is conveyed with political, economic, and other strategic considerations in mind. We provide input to policy development and promote broad collaboration between stakeholders to reduce the cost and risk associated with new CCS projects around the world.

The Knowledge Centre is very supportive of this project, and is pleased to be participating in the Coal Creek front-end engineering and design study as well as the redundancy study provides us with project-specific knowledge that we will use to support the proposed project.

We appreciate being considered for this project and look forward to participating with Coal Creek staff and the rest of the project team. If you have any questions or need any additional information, please do not hesitate to contact me. I may be reached at ranwar@ccsknowledge.com.

Sincerely,

A handwritten signature in blue ink, appearing to read "Rafay Anwar".

Rafay Anwar
Vice President, Project Development & Technical Services

ccsknowledge.com

306.565.5669

198 - 10 Research Drive

Regina, SK S4S 7J7 Canada

APPENDIX C

QUALIFICATIONS OF KEY PERSONNEL

CONWAY NELSON, P. Eng, PMP

43 Arlington St., Regina, Saskatchewan S4S 3H7 · 306 529-9426

conwaynelson@gmail.com

Engineering and Project Management professional with over 25 years of experience. Highly developed skills in engineering design, project management, people management, team building, leadership, communication, relationship development.

EXPERIENCE

November 2023 – present

Director, Carbon Management

Rainbow Energy Center, Bismarck, ND (remote from Regina, SK)

- Leading the development of an 8.5M tonne per year carbon capture and storage project for a 1200 MW coal fired power station.
- Overseeing execution of a \$47M NETL CarbonSafe grant to characterize geologic sequestration in the area local to the power station.
- Overseeing completion of a \$16M FEED study to finalize the scope and cost for the retrofit of carbon capture equipment to the power station and a subsequent Bridge Study to work towards a final investment decision.

May 2021 – October 2023

Vice President, Project Development & Technical Services,

International Carbon Capture & Storage Knowledge Centre, Regina, SK

- Led a team of engineers and chemists that provide high level process design and technical advice related to planning and execution of carbon capture projects across various industries (power generation, cement, oil and gas, refineries, etc.).
- Responsible for business development activities and grew the PD&TS team from five to twelve staff in two years.
- Presented at various industry conferences and webinars about Carbon Capture lessons learned and the work of the Knowledge Centre.
- Oversaw technical consulting services executed for carbon capture projects across a variety of industries.

June 2019 – May 2021

Manager, Power Production Project Delivery Office, SaskPower, Regina, SK

- Lead a team of 19 project managers and project control specialists to deliver the power production sustainment portfolio of projects (\$130m annual budget) as well as new generation projects that are managed by SaskPower (Chinook Power Station, Great Plains Power Station)
- Provide guidance and mentorship to Project Managers across Power Production to ensure effective project delivery.
- Emphasize continuous improvement by defining and optimizing our Project Management processes, developing, measuring and displaying KPI's while continuing to foster strong relationships with our engineering, construction and operations team members

EXPERIENCE (cont.)

May 2018 – June 2019

Lead, Project Lifecycle Optimization Initiative, SaskPower, Regina, SK

- Led a corporate optimization initiative to examine how projects are managed across SaskPower and make recommendations to improve performance. Performed internal and external research and worked with the SaskPower executive to achieve alignment regarding the practice of project management.
SaskPower established a corporate project management office based on my team's recommendations and have been working towards increasing project management maturity

May 2018 – June 2019

Lead, Project Lifecycle Optimization Initiative, SaskPower, Regina, SK

- Led a corporate optimization initiative to examine how projects are managed across SaskPower and make recommendations to improve performance. Performed internal and external research and worked with the SaskPower executive to achieve alignment regarding the practice of project management.
SaskPower established a corporate project management office based on my team's recommendations and have been working towards increasing project management maturity

April 2016 – May 2018

Manager, Power Production Project Delivery Office, SaskPower, Regina, SK

- Managed a team of 15 project managers and project control specialists to deliver the power production sustainment portfolio of projects (\$130m annual budget) as well as new generation projects that are managed by SaskPower (Chinook Power Station - \$680m budget).
- Worked closely with the Transmission business unit PDO to share best practices.

November 2013 – April 2016

Manager, Clean Energy, SaskPower, Regina, SK

- Led a team responsible for evaluating the feasibility of clean energy technologies primarily nuclear and solar power.

August 2008 – November 2013

Manager, Mechanical Engineering, SaskPower, Regina, SK

- Led a team of engineers and contracted resourced to manage projects and provide mechanical engineering services to execute the power production capital plan.

March 2006 – August 2008

Project Leader, SaskPower, Regina, SK

- Managed the refurbishment of a 300 Megawatt boiler and various projects related to emissions reduction technology for coal-fired power plants.

April 2003 – March 2006

Mechanical Engineer II, SaskPower, Regina, SK

- Performed engineering design and managed capital sustainment projects of increased complexity and magnitude for power generation plants.

EXPERIENCE (cont.)

March 2000 – April 2003

Mechanical Engineer I, *SaskPower, Regina, SK*

- Performed engineering design and managed capital sustainment projects for power generation plants.

January 1998 – March 2000

Project Engineer, *BAR Engineering, Lloydminster, AB*

- Design and project engineering work for various oil and gas clients.

PROFESSIONAL AFFILIATIONS

Professional Engineer *Association of Professional Engineers & Geoscientists of Saskatchewan*

Permission to Consult *Association of Professional Engineers & Geoscientists of Saskatchewan*

Project Management Professional *Project Management Institute*

EDUCATION

December 1997

B. Sc. in Mechanical Engineering, *University of Saskatchewan*

SKILLS

- Engineering
- Business Development
- Relationship Building
- Project Management
- Corporate Improvement
- Contract Management and Negotiation
- Communication
- Corporate Strategy
- People Management
- Leadership
- Coaching

ACTIVITIES & INTERESTS

- Travelling and spending time with my family
- Cycling, competing in triathlons, running races and adventure races
- Parent volunteer for youth hockey, triathlon, karate and speed skating

REFERENCES

Available upon request

Lyndsey Roemmich

Lyndsey is a Certified Public Accountant with 17 years of experience in a variety of fields including 11 years in the utility industry. Lyndsey joined Rainbow Energy Marketing Corporation in 2018 and has specialized in accounting for monthly electricity transactions, established foreign accounting processes, and played a leading role in coordinating tax compliance and external audit requests. Lyndsey has managed various research and accounting projects as well as implemented numerous process improvements. Prior to her career at Rainbow Energy, Lyndsey worked at a local investor-owned utility. She played an integral role in financial statement preparation and analysis as well as regulatory reporting. Lyndsey also serves on various boards in the community and in the accounting industry.

As Vice President of Finance for both Rainbow Energy Center and Nexus Line, Lyndsey directs all aspects of accounting operations including analyzing financial results, assisting in financial planning and results management, and maintains all necessary accounting policies and systems to ensure that all records are maintained in accordance with generally accepted accounting principles.

John Bauer

jbauer@greenergy.com, Office (701) 442-7000, Cell (701) 897-1853

Summary

As Director of North Dakota Generation for Great River Energy I have oversight of Great River Energy's Coal Creek Station. With over 40 years of experience in the industry, I possess a wealth of power and process knowledge and strive to enhance culture, teamwork, and leadership to maintain a highly engaged work force.

The honor to serve as a member of the Bismarck State College foundation board and as chair of Electric Power Research Institute's operations management technology program provides an opportunity to offer input that creates a well-trained workforce ensuring we improve operations and achieve safe, reliable, cost-effective and environmentally responsible power generation.

This first-hand knowledge and experience allow me to effectively contribute to the overall success of GRE's ND operation regardless of the situation.

EXPERIENCE:

Director, North Dakota Generation

March 2017 – current

Lead, plan and direct the operation and maintenance of North Dakota generating facilities in accordance with Great River Energy's (GRE) values, mission, and strategic imperatives, to achieve safe, reliable, efficient and environmentally sound production of electricity.

Manager, ND Operations Services

April 2015 – March 2017

Provide management oversight for plant operations, fuel operations and utility groups at Great River Energy's Coal Creek, Stanton and Spiritwood facilities. Provide overall site management for Spiritwood Station. Current Alternate Designated Responsible person for ND environmental compliance.

Leader, Plant Operations (day coordination) Great River Energy, Coal Creek Station

Oct 2005 – April 2015

Act as the Operating Authority and provide daily coordination for Coal Creek Station Plant Operations, Facilitate hiring and training for new hires (Operators / Operator Technicians), Mentor the 60 member Operations Team, coordinate new projects affecting the station, system start-up commissioning, work around guidance and emergent response to limit generation loss, Incident Commander for HazMat, fire and unit incidents, Provide leadership to the Operator Technician, Building Maintenance Utility and Temp Labor groups.

Leader, Plant Operations (shift coordination) Great River Energy, Coal Creek Station

Sept 2001 – Sept 2005

Act as the Operating Authority of Coal Creek Station, coordinate shift operation of a 12 member self-directed work team at Coal Creek Station, provide maintenance guidance on short outage and emergent situations to limit generation losses.

Control Room Operator Great River Energy, Coal Creek Station

July 1994 – Aug 2001

Operate Coal Creek Station from the central control room, coordinate maintenance efforts to support maintenance teams with clearances and equipment outage scheduling.

John Bauer

jbauer@greenergy.com, Office (701) 442-7000, Cell (701) 897-1853

Train other levels of plant operations to ensure qualified members for advancing positions.

Additional operations positions, Great River Energy, Coal Creek Station
Mar 1981 – June 1994

Monitor equipment, provide clearances, perform minor maintenance and provide troubleshooting support for Assistant Control Operator, Auxiliary Operator and Equipment Operator plant systems at Coal Creek Station. Provide job leader support for unit outages.

EDUCATION:

Great River Energy Leadership Training, Great River Energy

Foundational Leadership and Leadership in Action

MARC – Managers Guide to Employee Relations Leadership Training

Bismarck State College, Bismarck ND

Power Plant Technology

LEADERSHIP IN OTHER ORGANIZATIONS:

Bismarck State College Foundation board member

Program Chair for Electric Power Research Institute Plant Management Essentials Program

President, Ridgefield Condominium Association, Bismarck

SKILLS AND ABILITIES

Leadership Operations

Project Coordination

Mentoring

Safety

Expertise

Project Commissioning

Teamwork

Stacy L. Tschider

Stacy has strategically built and ran a successful business empire worth half a billion in revenues across the United States, Canada and Mexico. His portfolio of companies in the North American markets have over a quarter century of prominent success leading the wholesale electricity and natural gas, retail natural gas, propane, oil, and real estate industries.

His leadership and business savviness places him at the forefront in all companies he leads as President at: *Rainbow Energy Marketing Corporation, Peak Energy, Rainbow Energy Ventures, Rainbow Energy Center, and Nexus Line*. Entrepreneurial expertise in directing all aspects of operations and development in the highly complex and volatile energy trading commodities specializing in physical and financial products (spot prices, forwards, futures, options and derivatives), demonstrates his professional aptitude for risk management and profit generating strategies.

Stacy a founder of Rainbow Energy Center and Nexus Line, the newest additions to the REMC group of companies. Making strong progress toward diversifying vertically with ownership in two investments: a 1,151 MW power plant and 436 mile high voltage direct current (HVDC) transmission line in the upper Midwest. These acquisitions will not only pave the way in leading edge carbon capture and storage technology, more importantly save over 600 jobs with an estimated impact of \$1.5 billion in local North Dakota communities. These recent developments are near and dear to his heart, as forging progress in his local community bring a heightened level of purpose in his entrepreneurial journey.

Jeff Jonson

Jeff has been pivotal in overseeing organizational efforts in business development, joint venture and acquisitions for a business empire worth half a billion in revenues across the United States, Canada and Mexico. His portfolio of companies in the North American markets have over a quarter century of prominent success leading the wholesale electricity and natural gas, retail natural gas, propane, oil, and real estate industries. He pioneered key international business development initiatives as Chief Executive Officer at *RC Energy*, as well as Executive Vice President at: *Rainbow Energy Marketing Corporation, Rainbow Energy Ventures, Rainbow Energy Center, and Nexus Line*.

With his executive leadership expertise in energy trading and asset management across North America, Jeff spearheaded market penetration of the newly formed Mexico energy markets, as Chief Executive Officer of RC Energy in Mexico. RC is a wholesale and retail energy joint venture positioned as one of the leading power, natural gas traders and asset managers in Mexico. Optimizing his expertise, he expanded his geographical footprint with clients in the Guatemalan power market, trading between Mexico and Guatemala.

His business acumen and leadership experience in the energy sector have been crucial in our progress towards acquisitions in the Coal Creek power plant and HVDC transmission line.

Chris Faul

Chris began working with Rainbow Gas, a regional natural gas marketer, and commercial and industrial supplier. He later joined the Rainbow Energy Marketing Corporation (REMC) in hourly trading and settlements, prior to his promotion to Manager of Energy Markets and Projects for REMC and Rainbow Energy Ventures (REV). He leads the REMC settlements team's vast portfolio of bilateral sales, ISO/RTO markets, and asset management deals. His profitable growth strategies have been proven with his project management skills in leading all REV virtual business agreements throughout North America, including a European client. Chris has been a valuable and trusted executive advisor since the inception of the REMC group of companies, and an important foundation to a fast-growing group of companies.

As Vice President of Operations for both Rainbow Energy Center and Nexus Line, Chris provides overall direction to major business division heads. His direct reports include Rainbow Energy Center power plant and IT division heads.

DALTON NORTON

dalton.norton@rainbowenergycenter.com, Office (701) 207-8835, Cell (580) 370-6080

Summary

As an Engineer II at Rainbow Energy Center, I am responsible for the design, specifications, schedule, budget, and project management of various projects at Coal Creek Station. I have previously managed projects at Coal Creek Station and elsewhere that required innovative approaches and diligent planning. My experience in managing these projects has given me useful insight into how to take a project from concept to turnover and keeping safety, budget, and schedule a priority.

My knowledge and expertise in project management allow me to contribute to the overall success of Coal Creek Station and its multiple projects.

Experience

Engineer II, Coal Creek Station

November 2022-Current

Assist in management of the carbon capture project, as well as various other projects related to fire protection and HVAC. Carbon capture involvement consists of design review, integration with existing plant facilities, acting as a representative of REC, facilitating design discussion, coordination of engineering efforts, reviewing project costs, and developing project schedule. HVAC and fire protection projects consist of producing design drawings, assemble budget and schedule, procurement of material, coordinate contractors for execution, and oversee execution for quality and safety.

Project Manager, US Engineering Innovations

March 2022-November 2022

Managed the mechanical and plumbing construction of a 600,000 square foot hospital. Responsibilities consisted of labor management, material procurement, schedule management, interface with GC, design issue resolution, change order management, and managing startup and commissioning efforts.

Project Engineer, US Engineering Innovations

March 2021- March 2022

Reviewed project specifications and design drawings to submit and procure equipment/material suitable for installation. Collaboration with EOR for cost effective issue resolution. Reviewed design changes for constructability. Conducted pricing exercises for proposed design changes. Managed non-compliance and QA/QC tracking and resolution. Pull planned with GC to develop schedule. Coordinated with adjacent trades to prevent rework.

US Army Engineer Officer, United States Army

May 2017-March 2021

Managed earthwork project schedules, material procurement, logistics, life support, labor, and equipment maintenance. Projects typically consisted of earthwork grubbing/clearing, cut/fill, compaction, and grading.

DALTON NORTON

dalton.norton@rainbowenergycenter.com, Office (701) 207-8835, Cell (580) 370-6080

Education

Oklahoma State University, Stillwater OK
Bachelor of Science Mechanical Engineering

Skills and Abilities

Leadership

Matlab, VBA, Python, MS Project

Project Management

AUTOCAD, SolidWorks

ASHRAE, NFPA, IBC, ASME Standards

Jessica K. Bell

1224 1st Avenue Northeast • Beulah, ND • 701.891.9708 • belljessicak@gmail.com

OBJECTIVE To continue my endeavor to positively impact individuals and promote the energy industry by utilizing my experience in environmental and tax policy, business development and government relations.

EXPERIENCE **Rainbow Energy Center** **August 2022-Current**
Director, Government & Public Affairs

- Execute project development opportunities
- Evaluate best practices for carbon capture utilization and storage technologies
- Coordinate research efforts with the Energy & Environmental Research Center (EERC)
- Enhance environmental, social and governance practices
- Monitor and evaluate Federal and State regulations as they pertain to independent power producers
- Interact with regional transmission operators to ensure power deliverability

NACCO Natural Resources **May 2004-Current**
Environmental Manager of Northern Operations (2020-2022)

- Oversee and manage all environmental matters for northern operations
- Evaluate best practices for carbon management, including carbon capture utilization and storage technologies, soil carbon storage and other opportunities
- Evaluate and improve environmental, social and governance compliance
- Monitor and evaluate Federal environmental regulations impacting operations and articulate the position of NACCO Natural Resources for Federal Register Notice filings

Coyote Creek Mining Company
Environmental Manager (2017-2020)

- Primarily responsible for all environmental duties at the mine site including securing all permits for operation at local, state and federal level, air quality, wildlife management, cultural resources management, waste management and short and long-term budgeting and department management
- Active participant in the Lignite Energy Council trade organization
- Completed life of mine Individual Permit from the Department of the Army Corps of Engineers
- Initiated application to mine Federal coal with the Department of the Interior

The Coteau Properties Company Freedom Mine
Environmental Specialist (2007-2017)
Tour Guide (2006-2007)
Environmental Assistant (2004-2005)

- Manage over 15,000 acres of mined and reclaimed farm land alongside local producers
- Repeatedly proved mined and reclaimed farm land is more successful than before mining and released thousands of acres of productive land from company liability and bonds
- Write and update all environmental sections of mining permits
- Supervisory experience of both employees and contractors
- Initiated environmental baseline studies for first new coal mine in 30 years in ND

belljessicak@gmail.com

North Dakota State Senate
District 33 Senator & Citizen Legislator

Nov 2012-Nov 2022

Sixty-third Legislative Assembly

- Member of Industry, Business & Labor and Natural Resources standing committees and Vice-Chair of the Advisory Commission on Intergovernmental Relations interim committee, the former of which was statutorily eliminated during the subsequent legislative session to reduce government bureaucracy; Member of the Taxation interim committee
- Unanimously elected most outstanding freshman senator

Sixty-fourth Legislative Assembly

- Vice-Chair of Energy & Natural Resources and member of Finance & Taxation standing committees, Chair of the Taxation interim committee to study enhanced oil recovery and carbon dioxide capture technologies and related tax incentives and regulatory policies; and member of the Political Subdivision Taxation and Water Topics Overview interim committees
- Elected by peers to Legislative Management and selected to serve on the State Council for Interstate Adult Offender Supervision and the Commission on Legal Counsel for Indigents

Sixty-fifth Legislative Assembly

- Chair of Energy & Natural Resources and member of Finance & Taxation standing committees, Chair of the Taxation interim committee to study state business tax incentives and property taxes, member of Energy Development and Transmission interim committee and member of State Council for Interstate Adult Offender Supervision

Sixty-sixth Legislative Assembly

- Chair of Energy & Natural Resources, member of Finance & Taxation standing committees, Vice-Chair of the special committee on Ethics and member of the Government Finance, Human Services, Legacy Fund Earnings and Taxation interim committees

Sixty-seventh Legislative Assembly

- Chair of Finance & Taxation and member of Energy & Natural Resources standing committees, Chair of the Energy Development and Transmission interim committee and member of the Legacy Fund Earnings and Tribal and State Relations interim committees
- Elected by peers to Legislative Management

Legislative Accomplishments

- Prime sponsor of extensive property tax and industrial tax reform, creation of the Department of Environmental Quality, pore space use and migration reform and numerous energy-related issues
- Creation of the Pipeline Restoration and Oversight Program for landowners
- Main resource for legislative leaders on energy, ESG, taxation and regulatory issues
- Advocate for the elimination of inefficient government and incorporating business-minded policies to improve government agencies and proponent of investments in statewide infrastructure

Additional Legislative Positions

- Selected for and completed the 24-month Aspen Institute-Rodel Fellowship in Public Leadership, a program which seeks to enhance our democracy by identifying and bringing together the nation's most promising young political leaders to explore the underlying values and principles of western democracy, the relationship between individuals and their community and responsibilities of public leadership
- Executive committee member of The Energy Council, a group of legislators from energy producing states who develop and promote comprehensive, responsible energy policy initiatives at both the state and federal levels
- Executive committee member of the Streamlined Sales Tax Governing Board

belljesscak@gmail.com

EDUCATION **North Dakota State University**
Bachelor of Science Degree

Sept 2002-May 2006

- Natural Resources Management, Major
 - Social Sciences Emphasis
- Economics, Major

NOTEWORTHY INVOLVEMENT

- Member of MDU's Integrated Resource Plan Public Advisory Group, 2022-present
- Recipient of Prairie Business's Top 25 Women in Business in 2021
- Knife River Care Center Board of Directors, 2021-Current
- Solid fuels representative on Department of Environmental Quality Advisory Board, 2019-Current
- Beulah Wellness Center Foundation member, 2015-Current
- Mercer County Economic Development Board member, 2017-2020
- Elected to the Mercer County Soil Conservation District Board, 2010-2017
- Beulah Little People Pre-School president, 2012-2013
- Youth minister for St. Joseph's Catholic Church in Beulah, ND, 2006-2007
- Local, State and Regional Greater North Dakota Chamber involvement
- Special program advisor for North Dakota State University School of Natural Resources
- Certified Army Corps of Engineers wetland delineator
- Mine Foreman certification
- Mine Safety and Health Administration Surface Instructor certification
- Multiple national and local speaking engagements on behalf of North Dakota

JON PRICE

2481 Helen Dr. N, Mandan, ND 58554 ♦ 701-337-6096 ♦ jonprice_5@hotmail.com

PROFESSIONAL SUMMARY

Well-versed in building positive relationships with customers, coworkers, and other stakeholders. Hardworking, forward-thinking, and adaptable to dynamic company needs. Experience in marketing and relationship management as well as finance, accounting, and project management procedures while positively impacting overall productivity.

SKILLS

- Strategic planning
- Attention to detail
- Procurement
- Data analysis and modeling
- Management training courses
- Marketing strategy
- Contract Negotiation
- Statistical and financial analysis
- Stakeholder relations and networking
- Operations management
- Strategy development
- Cost analysis and savings
- Logistics and project management
- Financial management and budgeting
- Project scheduling and planning
- Data mining and analysis

WORK HISTORY

Director of Projects, 03/2023 to Current

Rainbow Energy Corporation – Bismarck, ND

- Oversee all extrinsic projects ongoing at Coal Creek Station to maximize the asset and create financially and environmentally beneficial uses for the site
- Identify business development opportunities to create economic opportunity for the site while ensuring financial benefit and permits are fulfilled to pilot multiple opportunities
- Manage contracts for ongoing and growth projects that have direct impact on the success of the site
- Identify value in operational plant success through energy market evaluation and modeling for market dynamics

Marketing Manager, 03/2020 to 03/2023

Marathon Petroleum Corporation – Mandan, ND

- Work independently to optimize the portfolio of business by actively managing accounts, focusing on the optimal price/volume relationship for all products while executing strategic direction of the territory
- Maintain a broad understanding of industry issues, government regulation, economic conditions, business outlooks, commercial and consumer needs, and MPC competitive strengths and weaknesses by market

Project Manager and Data Analyst, 03/2018 to 03/2020

Great River Energy – Underwood, ND

- Operate as Outage Coordinator for all scheduled Spiritwood Station outages
- Perform detailed assessments of project risks to determine constraints and develop mitigation strategies
- Gather requirements, define scopes, allocate resources, establish schedule and critical path that meet project demand
- Assume ownership of budgeting, forecasting, and strategic supply planning for revenue sources and fuel supply

Finance and Generation Specialist, 09/2015 to 03/2018

Great River Energy – Stanton, ND

- Perform general accounting functions including preparation of journal entries, account reconciliation and local balance sheet data to monitor and analyze general accounting functions as well as performance data analysis

EDUCATION

Master of Business Administration: 2022

University of Arizona, Eller College of Management

- Concentrations in Marketing and Management of Organizations
- Graduated with 3.9/4.0 GPA

Bachelor of Arts: Business Administration, 2017

University of Mary - Bismarck, ND

- Graduated with 3.7/4.0 GPA

Bachelor of Science: Mathematics, 2015

University of Mary - Bismarck, ND

- Graduated cum laude
- Graduated with 3.7/4.0 GPA

PROFICIENT COMPUTER SKILLS

- Microsoft: Word, PowerPoint, Excel, Access, and Project
- Ascend, Lawson, Cognos, Primavera P6, Salesforce, Tableau, SPSS and R Studio

RELEVANT INFORMATION

Collegiate Accomplishments

- Academic All-NSIC Cross Country and Track Selection 3 times
- University of Mary Dean's List 5 semesters
- University of Arizona O-MBA 2022 Top Entrepreneurship and Innovation recipient

Professional Involvement and Accomplishments

- Member of Great River Energy's North Dakota Cultural Enhancement Team - 2 terms
- Expanded portfolio by over 6.5M GPM of product, netting the company nearly \$9M incremental growth in 2021 and grading as one of the top 5 Marketing Managers across the country for 'Extraordinary Results' at YE review

Professional Affiliations

- University of Mary Mathematics Degree Advisory Board – 2017 to Current



JASON D. LAUMB

Director of Advanced Energy Systems Initiatives
Energy & Environmental Research Center (EERC), University of North Dakota (UND)
15 North 23rd Street, Stop 9018, Grand Forks, ND 58202-9018 USA
701.777.5114, jlaumb@undeerc.org

Education and Training

M.S., Chemical Engineering, University of North Dakota, 2000.
B.S., Chemistry, University of North Dakota, 1998.

Research and Professional Experience

May 2021–Present: Director of Advanced Energy Systems Initiatives, EERC, UND. Laumb provides leadership on projects related to advanced energy systems and leads a multidisciplinary team of scientists and engineers working on advanced energy technologies from pollution control to new energy platforms. Principal areas of interest and expertise include renewable energy, CO₂ capture, techno-economic modeling, extraction of critical materials, environmental control systems, supercritical CO₂ power cycles, and advanced gasification technologies. Experience includes biomass and fossil fuel conversion for energy production, with an emphasis on ash effects on system performance; trace element emissions and control for fossil fuel combustion systems, with a particular emphasis on air pollution issues related to mercury and fine particulates; and design and fabrication of bench- and pilot-scale combustion and gasification equipment.

September 2019–April 2021: Assistant Director of Advanced Energy Systems, EERC, UND. Laumb assisted the EERC executive team by providing leadership on projects related to advanced energy systems. Laumb led a multidisciplinary team of scientists and engineers working on advanced energy technologies from pollution control to new energy platforms. Specific areas of interest included CO₂ capture, techno-economic modeling, environmental control systems, supercritical CO₂ power cycles, and advanced gasification technologies. Research activities focused on low-carbon-intensity power cycles for fossil fuel-fired systems.

2008–August 2019: Principal Engineer, Advanced Energy Systems Group Lead, EERC, UND. Laumb led a multidisciplinary team of 30 scientists and engineers to develop and conduct projects and programs on power plant performance, environmental control systems, the fate of pollutants, computer modeling, and health issues for clients worldwide. Efforts focused on development of multiclient jointly sponsored centers or consortia funded by government and industry sources. Research activities included computer modeling of combustion/gasification and environmental control systems, performance of SCR technologies for NO_x control, mercury control technologies, hydrogen production from coal, CO₂ capture technologies, particulate matter analysis and source apportionment, the fate of mercury in the environment, toxicology of particulate matter, and in vivo studies of mercury–selenium interactions.

2001–2008: Research Manager, EERC, UND. Laumb led projects involving bench-scale combustion testing of various fuels and wastes as well as a laboratory that performs bench-scale combustion and gasification testing. Laumb served as principal investigator and managed projects related to the inorganic composition of coal, coal ash formation, deposition of ash in conventional and advanced power systems, and mechanisms of trace metal transformations during coal or waste conversion and wrote proposals and reports focused on energy and environmental research.

2000–2001: Research Engineer, EERC, UND. Laumb assisted in the design of pilot-scale combustion equipment and wrote computer programs to aid in the reduction of data, combustion calculations, and prediction of boiler performance. Laumb was also involved in the analysis of combustion control technologies' ability to remove mercury and the suitability of biomass as boiler fuel.

1998–2000: SEM Applications Specialist, Microbeam Technologies, Inc., Grand Forks, North Dakota. Laumb gained experience in power system performance including conventional combustion and gasification systems; knowledge of environmental control systems and energy conversion technologies; interpreting data to predict ash behavior and fuel performance; assisting in proposal writing to clients and government agencies such as the National Science Foundation and the U.S. Department of Energy; preparing and analyzing coal, coal ash, corrosion products, and soil samples using SEM/EDS; and modifying and writing FORTRAN, C+, and Excel computer programs.

Professional Activities

Member, American Chemical Society

Publications

Has coauthored numerous professional publications.



JOHN P. KAY

Principal Engineer, Emissions and Carbon Capture
Energy & Environmental Research Center (EERC), University of North Dakota (UND)
15 North 23rd Street, Stop 9018, Grand Forks, North Dakota 58202-9018 USA
701.777.4580, jkay@undeerc.org

Education and Training

B.S., Geological Engineering, University of North Dakota, 1994.
Associate Degree, Engineering Studies, Minot State University, 1989.

Research and Professional Experience

2011–Present: Principal Engineer, Emissions and Carbon Capture, EERC, UND.

- Responsibilities include management of CO₂ separation research related to bench-, pilot-, and demonstration-scale equipment for advancement of technology as well as development of cleanup systems to remove SO_x, NO_x, particulate, and trace elements to render flue gas clean enough for separation.
- Principal areas of interest and expertise include applications of solvents for removing CO₂ from gas streams to advance technology and look toward transformational concepts and techno-economic assessments.
- Experience includes 12 years of field testing site management and sampling techniques for hazardous air pollutants and mercury control in combustion systems along with 10 years of experience utilizing scanning electron microscopy (SEM), x-ray diffraction (XRD), and x-ray fluorescence (XRF) techniques to analyze coal, fly ash, biomass, ceramics, and high-temperature specialty alloys.
- Other interests include computer modeling systems and high-temperature testing systems.

2005–2011: Research Manager, EERC, UND.

- Responsibilities included management and supervision of research involving design and operation of bench-, pilot-, and demonstration-scale equipment for development of clean coal technologies.
- Work also involved testing and development of fuel conversion (combustion and gasification) and gas cleanup systems for removal of sulfur, nitrogen, particulate, and trace elements.

1994–2005: Research Specialist, EERC, UND.

- Responsibilities included conducting SEM, XRD, and XRF analysis and maintenance; creating innovative techniques for analysis and interpretation of coal, fly ash, biomass, ceramics, alloys, high-temperature specialty alloys, and biological tissue; managing day-to-day operations of Natural Materials Analytical Research Laboratory; supervising student workers; developing and performing infrared analysis methods in high-temperature environments; and performing fieldwork related to mercury control in combustion systems.

1993–1994: Research Technician, Agvise Laboratories, Northwood, North Dakota.

- Responsibilities included receiving and processing frozen soil samples for laboratory testing of chemical penetration, maintaining equipment and inventory, and training others in processing techniques utilizing proper laboratory procedures.

1991–1993: Teaching Assistant, Department of Geology and Geological Engineering, UND.

- Responsibilities included teaching Introduction to Geology Recitation, Introduction to Geology Laboratory, and Structural Geology; preparation and grading of assignments; and administering and grading class examinations.

1990–1992: Research Assistant, Natural Materials Analytical Laboratory, EERC, UND.

- Responsibilities included operating x-ray diffractometer and interpreting and manipulating XRD data, performing software manipulation for analysis of XRD data, performing maintenance and repair of XRD machine and sample carbon coating machine, preparing samples for XRD and SEM analysis, and performing point count analysis on SEM.

Professional Activities

Member, ASM International

Member, American Ceramic Society

Member, Microscopy Society of America

Publications

Has authored or coauthored numerous publications.

PATRICIA (TISHA) SCROGGIN-WICKER, PE

Director of Process Technology



Patricia is the Director of Process Technology for our power generation business working with Energy clients at Burns & McDonnell. Her team's responsibilities today include the Hydrogen, Carbon Capture, Liquefied Natural Gas (LNG), Flow Battery and other process-oriented technology applications within the power generation industry.

Her career has included from the outset experiences with air quality control, chemical feed, water treatment and other process-oriented technologies. She's had experiences with numerous first of a kind installations including engineering, construction and startup experiences.

Hydrogen and Carbon Capture

Process Technology Director. Assist clients with identifying applicable technology that meets project needs from a scope, schedule and budget perspective. Provide direction to project teams as they are executing technology reviews, scale up evaluations, pilot projects and grid scale projects.

LNG Industry Lead

Multiple Locations | 2019 - Present

Business Manager. Responsible for market understanding, OEM relationships and technical applications around the peak shaving LNG market with respect to the power generation market.

Flow Battery Industry Lead

Multiple Locations | 2019 - Present

Business Manager. Responsible for market understanding, OEM relationships and technical applications for the evolving flow battery industry. Submitted on over 100 MWhr of flow battery project opportunities.

Water Redirection Program | Duke Energy Corp

Multiple Locations | Oct 2015 - Sep 2020

Process consultant. Worked on multiple process wastewater facilities at twelve stations. FGD wastewater treatment system includes clarification, filtration, biological and final polishing.

FGD Physical/Chemical & ZLD Wastewater Treatment | Indianapolis Power & Light Company

Petersburg, Indiana | May 2014 - Jul 2020

Process consultant. IP&L's waste-water treatment plant project, an EPC project, included the addition of a water treatment plant with a zero-discharge facility, thermal evaporation system, and a distillate stream for reuse in the FGD and other systems as permitted in order to discontinue the discharge of bottom ash, fly ash, FGD, and other waste-water materials into their existing ash ponds. The proposal includes as an option the installation of a bottom ash dewatering system allowing for the dewatered ash to be transported to a permitted landfill for disposal. Worked on multiple process wastewater facilities at a

EDUCATION

Bachelors, Chemical Engineering,
2002

REGISTRATIONS

Professional Engineer (GA, IL, MO,
NH)

19 YEARS WITH BURNS & MCDONNELL

19 YEARS OF EXPERIENCE

1,760-MW coal-fired facility. FGD wastewater treatment system includes clarification, softening and thermal evaporation using falling film evaporators. Remaining plant wastewater flows are treated within an enhanced heavy metals precipitation process followed by a mercury reduction filtration system.

High Desert Power Project | Tenaska, Inc.

Kansas City, Missouri | Mar 2015 - Feb 2017

Process engineer. Worked on optimization of existing Zero Liquid Discharge system on combined cycle cooling tower blowdown system. Coordination with existing plant operations while optimizing various systems.

Mustang | OGE Energy Corp.

Oklahoma City, Oklahoma | May 2014 - Sep 2016

Process engineer. Worked on FEED study to develop new generation simple cycle and combined cycle site. System design including raw water treatment, demineralization, sampling and cooling tower and cycle chemical feed systems.

Confidential Client | Big Rivers Electric Corporation

Henderson, Kentucky | Jul 2013 - Dec 2014

Project team. Multiple facility review of existing plant water balances for identification and implementation of water reuse and wastewater minimization technologies. Determine potential compliance requirements associated with upcoming proposed National Effluent Limitation Guidelines.

Frank A. Tracy Generating Station | NV Energy, Inc.

Nevada | Feb 2012 - Dec 2013

Process engineer. Worked to review the plant water usage and treatment capabilities to develop a comprehensive water management plan. The plan improved water usage and optimize the use of water treatment equipment to maintain zero liquid discharge operation. This facility is a multi-unit station with oil and gas fired units.

Iatan 2 | Evergy, Inc.

Kansas City, Missouri | Dec 2005 - Jul 2013

Process engineer. Worked on design, procurement and 2.5-year assignment onsite for construction oversight and startup of water related systems at a new 900-MW coal-fired power plant. Systems include wastewater treatment system, condensate polishing, raw water treatment, boiler cycle, sampling and demineralized water. New unit, including scrubber blowdown, is a Zero Liquid Discharge (ZLD) site.

Merrimack Station - Zero Liquid Discharge | Eversource Energy

New Hampshire | Oct 2010 - Apr 2013

Process engineer and Project Manager. Worked on fast track technology selection, design, procurement, and startup of an evaporator/crystallizer Zero Liquid Discharge system for FGD wastewater. System has ability to produce a concentrated stream for landfilling with fly ash, or a fully dry waste product suitable for landfill.

Council Bluffs Unit 3 | MidAmerican Energy

Iowa | Nov 2006 - Dec 2011

Process engineer. MidAmerican Energy's Council Bluffs Unit 3 AQCS project, an EPC project, included the addition of two SDAs, two fabric filters, ID fans and related equipment for the 700 MW unit. Worked on air pollution control upgrade at 690-MW coal-fired power plant. Duties included design review, drawing review, equipment checkout, water balance design and interfacing with other disciplines and contracts. Equipment included dry scrubbers, fabric filters, ductwork, lime slakers and recycle slurry ash systems.

Louisa Scrubber Project | MidAmerican Energy

Iowa | Nov 2005 - Dec 2011

Contract engineer. Worked on air pollution control upgrade at 700-MW coal-fired power plant. Duties included design review, drawing review, equipment checkout, water balance design and interfacing with other disciplines and contracts. Equipment included dry scrubbers, fabric filters, ductwork, lime slakers and recycle slurry ash systems.

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| Oct 2003 - Dec 2007

Process engineer. Worked on design, specification, procurement and submittal reviews for water system equipment upgrades at 500-MW combined cycle power plant. Wrote equipment procurement contracts, performed bid evaluations and reviewed drawing submittals for additional lime slaker, silo, and redundant pressure filter and demineralizer system.

Emery Generating Station | Alliant Energy

| Apr 2002 - Jul 2007

Process engineer. The Power Iowa project included two General Electric 7FA combustion turbine-generators (CT) coupled with two heat recovery steam generators (HRSG) and a single common steam turbine-generator (ST) to operate in combined cycle mode. Worked on design, procurement, and construction of water related systems at 550-MW combined cycle power plant. Systems include cycle chemical feed, circulating water chemical feed, raw water chemical feed, demineralized water, potable water, sampling and analysis, service water, raw water, and well water. Design involved use of reclaimed water and well water for primary cooling water makeup needs. Preparation of fully comprehensive life cycle cost analysis and plant water balance.

Sheboygan Falls Energy Station | Alliant Energy

| Jan 2004 - Sep 2006

Process engineer. Worked on design, procurement, and construction of water related systems at 350-MW simple cycle power plant. Wrote equipment procurement contracts, performed bid evaluations and reviewed drawing submittals for both the service water chemical feed and potable water systems.

Meramec, Rush Island & Sioux Power Plants | Ameren Corporation

| Mar 2003 - Mar 2004

Process engineer. Worked on primary water treatment and potable water system studies. Studies included existing equipment assessment, design basis review in terms of performance, functionality, reliability, and redundancy, identification of required equipment replacements and significant maintenance expected during the next 10 years, assess current and future compliance with EPA and MO-DNR drinking water regulations, propose modifications and upgrades to existing systems,

evaluate alternatives for potable water supply. Preparation of anticipated capital expenditures and operating and maintenance expenses to keep system operating. Life cycle cost analysis for alternative water treatment options.

AARON BENNETT, PE

Project Manager



Aaron serves as a Project Manager in the Burns and McDonnell Energy Global Practice. In recent years, Aaron has been responsible for Project and Engineering Management on projects including two LNG peak shaver projects, wastewater treatment projects at coal fired power plants, and air quality control projects at coal fired power plants. These multi-discipline projects required coordination between multiple engineering disciplines, procurement, and construction

professionals to achieve safe and successful projects. In addition to project and engineering management activities, Aaron has been responsible for structural steel, ductwork, and turbine crane design and procurement

contracts and the piling construction contract a site with karst geology and significant subsurface challenges. He has also been responsible for layout and design of new structural framing systems, analysis of existing structural framing systems, design and coordination of foundation systems, analysis and design of ductwork, and connection design for Selective Catalytic Reduction reactors.

EDUCATION

Masters, Civil Engineering, 2004;
Bachelors, Civil Engineering, 2002

REGISTRATIONS

Professional Engineer
(MS, OH, WY)

17 YEARS WITH BURNS & MCDONNELL

18 YEARS OF EXPERIENCE

RAINBOW ENERGY CENTER | RAINBOW ENERGY / EERC

Underwood, North Dakota | July 2022 - Present

Project Manager. FEED Study for outside boundary limits systems and equipment for a Carbon Capture Facility at both Units at Rainbow Energy Center. The project includes preliminary design, model development, procurement and construction package development, and cost estimate development for the outside boundary limit systems and equipment for the Project. The systems and equipment include modifications to the river water system; a new cooling water loop, cooling tower, and circulating water pumps; steam lines and condensate return lines between the existing facility and carbon capture island; flue gas ductwork and ductwork support structures; warehouses; and connection of multiple plant utility systems.

RHINELANDER GAS COMPRESSOR | WEC ENERGY GROUP

Rhineland, Wisconsin | Nov 2020 - Aug 2022

Project Manager. Natural gas compressor station for peaking service during peak gas usage periods. The project includes project development, site selection, cost estimate development, and permitting for the compressor station. The station will include a reciprocating natural gas compressor, vent gas recovery system, electrical and control equipment, pre-engineered metal building, and site development. Project manager supporting siting the proposed Gas Compressor Station, development of the Certificate of Authority Application for the Project. Work to date include preliminary engineering for site layout and cost estimate development as well as site surveys to support permitting. These surveys include wetland surveys, sound surveys, and a geotechnical investigation. BMcD is currently developing procurement specifications for long-lead time equipment with the intent of proceeding with the project on an EPOC basis once the project is approved by the Wisconsin Public Service Commission.

AARON BENNETT, PE

(continued)

Wisconsin LNG | WEC ENERGY GROUP

Milwaukee, Wisconsin | Apr 2019 - Apr 2023

Project Manager. EPC project to install Liquefied Natural gas (LNG) peak-shaving facilities at two sites in southeast Wisconsin. Supported client in siting the proposed facilities, performing wetland, cultural, and land surveys as well as permitting with local, county, and state agencies. Performing Owner's Engineer type role for Owner Supplied Equipment (LNG Tank and LNG Process Equipment). Executing the remainder of the scope on an EPC basis including purchasing gas compressors, electrical and control equipment, construction of the facility with the exception of the LNG Tanks, and commissioning and startup of the LNG Facilities.

Multiple Steam Stations | DUKE ENERGY

North Carolina | Oct 2015 - Jul 2019

Project Manager. The program involved developing the scope, design, schedule, and cost estimates to bring multiple sites into compliance with the EPA effluent limitations guidelines and CCR rule. In general, the scope included closing the ash pond and redirecting flows to a treatment plant. Duties included erosion & sediment control plans, hydrologic & hydraulic calculations, drainage design, site grading, road design, development of contract drawings and specifications. Three sites as part of a program focused on CCR and ELG compliance at 10 operating plants. The scope of work consisted of dry bottom ash conversions, wastewater treatment of FGD blowdown and plant process water and retention basins for treatment of plant process water. The project included preliminary engineering, detailed design, permitting support, equipment procurement and field engineering support. Responsibilities include scope definition with client during initial phase, coordination of engineering design activities, procurement of major engineered equipment, and development of construction contracts.

Four Corners SCR Project | Arizona Public Service

Fruitland, New Mexico | Apr 2014 - Jan 2019

Project Manager and Engineering Manager. Project to support APS as Owners Engineer for the Units 4 & 5 SCR Project. Mr. Bennett led the engineering team in evaluation of the EPC contractor's open-book proposal. This included review of multiple SCR system arrangement options, OEM proposal evaluation, and detailed review the contractor's proposal and cost estimate. After EPC contract award, Mr. Bennett has continued to lead the technical team in evaluation of the EPC contractor's technical submittals, schedule, and installed equipment and material. The project consists of new SCR's, economizer waterside bypass system, air preheaters, urea to ammonia conversion equipment, and dry sorbent injection system for two 770 MW coal fired units.

Ghent Generating Station Units 1, 2, 3, & 4 | LG&E AND KU SERVICES COMPANY

Ghent, Kentucky | Oct 2014 - Dec 2016

Project and engineering manager. Project to capture and transport stormwater that potentially contains CCR material to a designated CCR treatment basin. The project included significant modifications to site grading and underground stormwater piping. New pumps along with corresponding new electrical and control equipment were utilized to convey water from the CCR area to the treatment basin several thousand feet away.

Sibley Generating Station Car Shaker Building | EVERGY METRO INC

Sibley, Missouri | Oct 2014 - Dec 2016

Project and engineering manager. Multiple structural upgrade projects at Sibley Station. Projects include a clarifier enclosure and foundation, electrical building, various monorails, access modifications, and miscellaneous foundations.



AARON BENNETT, PE

(continued)

Allen Steam Station | DUKE ENERGY

Belmont, North Carolina | Oct 2015 - Oct 2016

Project and engineering manager. Project to install a redundant gray water tank. Project includes design of a new field erected tank, new pile supported foundation, and interconnecting piping and control valve. BMcD performed the detailed design and assisted OG&E with procurement of the field erected tank, foundations and earthwork construction contract, and mechanical construction contract.

Muskogee 4,5, 6 Bottom & Waste Ash Stackout Pad | OGE ELECTRIC SERVICES CORPORATION

Fort Gibson, Oklahoma | Jun 2015 - Apr 2016

Project and engineering manager. Project to achieve compliance with CCR regulations prior to the compliance deadline. Mr. Bennett led the team in evaluation of the various compliance options and development of the detailed design packages to support to implement the compliance plan. Mr. Bennett and several design engineers participated in commissioning of the modified systems to facilitate completion prior to the deadline.

SOONER STATION CCR UPGRADES | OGE ELECTRIC SERVICES CORPORATION

Red Rock, Oklahoma | Jun 2015 - Apr 2016

Project and engineering manager. Project to achieve compliance with CCR regulations prior to the compliance deadline. Mr. Bennett led the team in evaluation of the various compliance options and development of the detailed design packages to support to implement the compliance plan. Mr. Bennett and several design engineers participated in commissioning of the modified systems to facilitate completion prior to the deadline.

Ghent Generating Station | LG&E AND KU SERVICES COMPANY

Ghent, Kentucky | Mar 2013 - Apr 2016

Engineering Manager and Lead Structural Engineer. Responsible for design review, schedule review, and project oversight of work performed by the EPC contractor and equipment suppliers. The project consists of new pulse jet fabric filters, ash handling equipment, ID fans, activated carbon injection, interconnecting ductwork, and associated structural steel and foundations at four units on site. In addition, Mr. Bennett performed inspections of existing ductwork and developed contract documents for reinforcing and modification of the existing ductwork to meet increased design pressures.

Ghent CCR Warehouse | LG&E AND KU SERVICES COMPANY

Ghent, Kentucky | Jul 2014 - Mar 2016

Project and engineering manager. Project to improve operability of the CCR material handling area. The project included demolition of existing drag chain conveyors and installation of new bottom ash bunkers in their place. Installation of the bottom ash bunkers required significant modifications and resupport of the existing submerged chain conveyor building as well as relocation of underground duct bank and associated electrical and control cables. The project also included a new elevator, new storage warehouse, and multiple access platforms.

Warren County Power Station | WARREN COUNTY ENERGY PARTNERS

Front Royal, Virginia | Jun 2011 - Oct 2012

Structural engineer. Project was a joint venture with Zachry. Hired by Dominion Virginia Power to perform engineering, procurement and construction Services for a 1,300+ MW Gas Fired power facility. Project consisted of three MHI 501G gas turbines and a MHI TCF4 Steam Turbine. Responsible for various aspects of structural design and contract management on a new 3-on-1 Combined Cycle Power Plant that was constructed on an EPC basis. Mr. Bennett was responsible for the steam

AARON BENNETT, PE

(continued)

turbine crane procurement package and the micropiling construction subcontract. The micropiling construction contract was complicated by karst geology, including sinkholes and highly variable rock depths, and a subsurface endangered species. Mr. Bennett was responsible for concrete foundation and piling design for the Heat Recovery Steam Generator, Pipe Rack, Boiler Feed Pump, and multiple other equipment and structures. He was also responsible for coordination of structural aspects on multiple mechanical and electrical equipment contracts.

Musheireb Downtown Doha | MSHEIREB PROPERTIES

| Oct 2010 - Dec 2011

Structural engineer. Provided Design/Bid/Build services and constructed reinforced concrete buildings. Responsible for design of four story underground reinforced concrete parking structures and interconnecting service tunnels as part of a large development project in Doha, Qatar. The parking structures supported above grade, multistory, multiuse reinforced concrete structures from transfer slabs at ground level and utility rooms located throughout the lower levels. In addition, Mr. Bennett coordinated structure interface and expansion joint details between multiple architectural and engineering entities.

Units 3 and 4 AQCS Retrofit | NRG Energy, Inc.

Delaware | Jun 2009 - Sep 2010

Lead Ductwork and Structural Steel Engineer. Air quality upgrade project on Unit 4 of the Indian River Generation Facility. The project included new flue gas ductwork and corresponding support steel, utility racks, platforms, and evaluation and repair of existing ductwork. Mr. Bennett was responsible for procurement packages and structural design of ductwork, structural steel, and fabric expansion joints.

MSAT II Reformat Stripper Project | Valero Energy Corporation

Multiple Locations | Mar 2009 - Aug 2009

Structural engineer. Provided engineering, procurement, and construction services for new heart-cut reformat splitters at three refineries. Units reduced the benzene content of reformat to comply with Environmental Protection Agency Mobile Source Air Toxics Tier 2 (MSAT2) regulations. Responsible for design of reformat splitter baffle wall for vessels associated with benzene reduction projects at multiple refineries. Mr. Bennett also coordinated and designed radial access platforms for new vertical vessels at the various project sites.

Crystal River SCR and FGD Upgrade | Environmental Partners Crystal River

Florida | Jun 2007 - Apr 2009

Structural engineer. Clean Air EPC project for Progress Energy. Included the addition of two SCRs, two wet scrubbers, ID fans, reagent prep, limestone and gypsum material handling, related equipment and modifications to two ESPs for the two 750 MW units. Included retrofitting two 750MW coal fired power plant units with SCR and wet FGD systems. Responsible for analysis and design of ductwork support and utility support steel as well as coordination of structural issues with Burns and McDonnell's EPC partners. Additionally, Mr. Bennett designed support saddles for large diameter FRP ductwork and assisted in SCR support truss erection planning.

Thomas Hill Environmental Controls Retrofit Project | Associated Electric Coop Inc

Missouri | Feb 2006 - Dec 2007

Structural engineer. Responsible for analysis and design of ductwork; ductwork, SCR, and air preheater support structures; and SCR connections. Mr. Bennett designed drilled shaft and micropile supported foundations. He also served contract engineer for fabrication of the structural support steel and fabric expansion joints



JUSTIN SCHNEGELBERGER, PE

Engineering and Strategy Manager – Decarbonization & Emerging Technology



Mr. Schnegelberger oversees engineering and strategy for decarbonization and emerging technology markets within Burns & McDonnell's Power Division. He focuses on market and opportunity development in this space and is responsible for client and vendor relationship development and management for decarbonization

technologies (including but not limited to carbon capture, direct air capture, hydrogen, long duration energy storage, and non-traditional power generation technologies)

EDUCATION

- ▶ BS, Mechanical Engineering

REGISTRATIONS

- ▶ Professional Engineer (KS)

16 YEARS WITH BURNS & MCDONNELL

17 YEARS OF EXPERIENCE

Mr. Schnegelberger has also served as Proposal Manager for EPC project, Lead Performance Engineer, Project Manager, Development Engineer, Contract Engineer, and Owners Engineer on combined-cycle, simple-cycle, coal-fired, cogeneration, combustion turbine inlet cooling, carbon capture, compressed air energy storage, and renewable energy projects. In these roles, responsibilities include performance testing, thermal performance evaluation, estimation and optimization, equipment specification, contract award and management, conceptual design, technical feasibility, economic analysis, cost estimating, and preliminary scheduling. Below is a sampling of recent experience.

Carbon Capture and Direct Air Capture Technology Manager

2021-Current

Technology and Business Manager for post combustion carbon capture and Direct Air Capture (DAC) technology and projects. Responsible for technical development of carbon capture and DAC opportunities and internal carbon capture and DAC business unit development to support carbon capture and DAC technology and project opportunities. Work with technology suppliers and end-user to develop and implement carbon capture and DAC solutions.

Development Engineering Manager

2018-2023

Responsible for management of proposal managers and development engineering and oversight of project development work ranging from initial conceptual design and evaluation through to thermal performance and acceptance testing. Specialized in project scoping, technology evaluation, new and existing generation assessment, generation planning, project development, generation capital and operating cost estimating and development, conceptual design, feasibility evaluation, and thermal performance for all types of generation projects including fossil and renewable generation, decarbonization technologies, and new and emerging technologies.

EPC Proposal Manager

2015-2018

Proposal Manager and Engineering Manager for gas turbine EPC proposals. Project include simple cycle, combined cycle, and cogeneration/combined heat and power projects. Plant sizes range from small 50 MW aeroderivative and frame combustion turbines to 1000+MW advanced class turbine combined cycle projects, and have included all the major combustion turbine technology suppliers. Responsibilities include preliminary design oversight, schedule development, contract negotiations, management of the engineering team, and overall proposal development management.

JUSTIN SCHNEGELBERGER, PE

(continued)

Sutter Energy Center Carbon Capture Unit (CCU) Feed Study, Calpine Corp.

Sutter County, California | 2023-Present

Lead project development engineer for the Project Management Contractor/Owner's Engineer (PMC/OE) support services for a Carbon Capture Unit (CCUS) at Calpine Corp's existing natural gas combined-cycle power plant. Burns & McDonnell is operating as an extension of CALPINE, providing oversight and review of the front-end engineering design (FEED) contractor.

CO2 Capture and Compression Plant Evaluation Owners Engineer, Basin Electric Power Cooperative

North Dakota | 2010

Lead project development engineer. Owner's engineer for technology provider bid review and FEED evaluation of a 120 MW equivalent slip stream CO₂ capture and compression plant at the existing Antelope Valley station. Responsibilities included technical evaluation of CO₂ capture plant technology provider proposals, technology provider design review, performance evaluation, steam turbine integration, and technical submittal review.

Multiple Projects

2013-2016

Lead performance engineer/performance manager in charge of overall thermal performance evaluation, modeling, and optimization for all performance related projects and project activities. Responsibilities include development, oversight, and quality control of thermal performance evaluation, detailed thermal performance modeling and estimation, performance optimization, equipment selection and evaluation, performance test direction and oversight, contract performance review and guarantee parameter development and definition.

Basin Electric Power Cooperative

2014-2015

Project development lead. New generation planning evaluation for combined and simple cycle projects located in North Dakota. Project scope includes technology evaluation and Project Definition Report (PDR) for new combined cycle and simple cycle generation. Responsible for oversight and management of technology assessment considering multiple configurations of combined cycle and simple cycle generation. After completion of the technology assessment, responsible for oversight of the PDR developed a 2x1 combined cycle facility including conceptual plant design and development of engineering deliverables (site general arrangement drawings, electrical one-line diagrams, water balances, project schedule, plant definitions, and thermal performance estimation and evaluation) to support development of project capital and O&M cost estimates, as well of development of major equipment purchase specifications.

New Generation Project Development | Sask Power

2014-2016

Project development lead. New generation planning evaluation for combined and simple cycle projects located in Saskatchewan, Canada. Project scope includes technology evaluation and Project Definition Report (PDR) for new combined cycle and simple cycle generation at greenfield and brownfield sites. Responsible for oversight and management of technology assessment considering multiple configurations of combined cycle and simple cycle generation. After completion of the technology assessment, responsible for oversight and management of the PDR developed for two combined cycle and two simple cycle generation options including conceptual plant design and development of engineering deliverables (site general arrangement drawings, electrical one-line diagrams, water balances, project schedule, plant definitions, and thermal performance estimation and evaluation) to support development of project capital and O&M cost estimates.



JUSTIN SCHNEGELBERGER, PE

(continued)

Capital Power

2013-2015

Performance manager. New combined cycle generation located in Alberta, Canada. Project scope includes development of major equipment (CTG, HRSG, and STG) procurement specifications, and proposal bid, evaluation, negotiation and award. Additional project scoping and definition evaluations performed to determine overall plant configuration and scope.

Queen Elizabeth Power Station | SaskPower

2013-2016

Performance manager. Queen Elizabeth Power Station Repowering project is a 6x1 combined cycle project located in Saskatchewan, Canada. Project scope includes addition of six Hitachi H25 gas turbines, six once through steam generators, and one condensing steam turbine. Responsible for oversight of project thermal performance direction and activities.

Riverton Power Station | Empire District Electric Company

2013-2016

Performance manager & lead performance engineer. Conversion of an existing simple cycle Siemens V84.3 gas turbine to a 1x1 combined cycle during EPC proposal phase carrying through to project award and execution. Scope of work included thermal performance optimization, cycle design, project guarantee development, negotiation of EPC contract, equipment specification development, evaluation, negotiation and award.

CAMP Project Evaluation for Lansing Generating Station | Alliant Energy

2011

Lead development & performance engineer. A plant evaluation and upgrade study. The study evaluated various plant efficiency upgrades and replacement and maintenance projects for a nominal 340 MW coal fired power plant. Evaluation included various plant efficiency upgrade projects including boiler, steam turbine generator, and BOP systems impact analysis. Responsibilities included conceptual design, plant performance impact estimation and evaluation, plant and project thermal performance optimization, and project economic analysis. Responsible for development of detailed equipment specification for existing steam turbine steam path and equipment upgrade.

CAMP Project Evaluation for Ottumwa Generating Station | Alliant Energy

2011-13

Lead development & performance engineer. A plant evaluation and upgrade study. The study evaluated various plant efficiency upgrades and replacement and maintenance projects for a nominal 725 MW coal fired power plant. Evaluation included various plant efficiency upgrade projects including steam turbine generator and BOP systems impact analysis. The project included a complete steam turbine upgrade and steam path redesign as well as generator upgrade. Responsibilities included conceptual design, plant performance impact estimation and evaluation, plant and project thermal performance optimization, plant system impact estimation and evaluation, and project economic analysis.

65 MW Steam Turbine Repower Assessment | South Mississippi Electric Power Association

Mississippi | 2008-2012

Lead performance and contract engineer. A 65 MW steam turbine repowering project in Mississippi. Responsibilities included conceptual design, performance estimation and evaluation, performance optimization and modeling using GE's GateCycle software, technical specification development, performance testing, coordination with third party consultants to



JUSTIN SCHNEGELBERGER, PE

(continued)

conduct a steam path evaluation and evaluation of existing equipment for possible upgrades to the existing steam turbine and other equipment, development of plant heat balances, and plant performance testing.

1300 MW Combined Cycle Power Plant EPC Proposal | Saudi Electricity Company

Saudi Arabia | 2011-2012

Lead performance engineer. A 1,300 MW combined cycle power plant project in Saudi Arabia. Plant consists of multi-unit “E” gas turbines in combined cycle configuration utilizing air cooled plant heat rejection. Gas turbine evaluation included Siemens and GE “E” class units. Responsibilities included conceptual design, plant thermal performance estimation and evaluation, development of plant heat balances, thermal performance optimization and modeling using GateCycle software, development of equipment technical specifications, and system design.

1700 MW Combined Cycle Power Plant EPC Proposal | Saudi Electricity Company

Saudi Arabia | 2011-2012

Lead performance engineer. A 1,700 MW combined cycle power plant project in Saudi Arabia. Plant consists of multi unit “F” gas turbines in combined cycle configuration utilizing air cooled plant heat rejection. Gas turbine evaluation included Siemens and GE “F” class units. Responsibilities included conceptual design, plant thermal performance estimation and evaluation, development of plant heat balances, thermal performance optimization and modeling, development of equipment technical specifications, and system design.

Saudi Electricity Company

Saudi Arabia | 2010-2011

Lead performance engineer. A 1,200 MW simple cycle to combined cycle conversion project in Saudi Arabia. Existing plant consists of 40 simple cycle gas turbines to be converted to 10 4x1 air cooled combined cycle plants. Responsibilities included conceptual design, performance estimation and evaluation, and performance optimization and modeling using GE’s GateCycle software.

CO₂ Capture and Compression Plant Evaluation, Tenaska

Texas | 2010

Lead project development engineer. Owner’s engineering support for the nominal 900 MW Trailblazer coal fired power plant. The plant includes CO₂ capture and compression. Responsibilities included technical and performance evaluation for the plant as well as technical review and evaluation of potential CO₂ capture technology providers.

CO₂ Capture and Compression Preliminary Design and Estimating, Powerspan Corporation

2009

Lead project development engineer. Led technical evaluation of CO₂ compression technology and equipment conceptual design for a 140 MW subcritical lignite fired pulverized coal plant. Responsibilities included conceptual design for integration of the CO₂ capture process, technical review of the CO₂ capture process, and technical and economic evaluation of CO₂ compression technology and options.

CO₂ Capture and Compression Preliminary Design and Estimating, Powerspan Corporation

Louisiana | 2009

Lead project development engineer. Feasibility evaluation for the implementation of CO₂ capture and compression at the existing Entergy Nelson Unit 6 600 MW Subcritical Lignite fired pulverized coal plant for the integration and balance of plant design to support addition of the Powerspan Corp. CO₂ capture process. Responsibilities included conceptual design,



JUSTIN SCHNEGELBERGER, PE

(continued)

project definition, performance modeling and plant performance evaluation, capital cost estimating, and feasibility evaluation.

CO₂ Capture and Compression Preliminary Design and Estimating, Powerspan Corporation

Louisiana | 2009

Lead project development engineer. Feasibility evaluation for the implementation of CO₂ capture and compression at the existing Entergy Nelson Unit 6 600 MW Subcritical Lignite fired pulverized coal plant for the integration and balance of plant design to support addition of the Powerspan Corp. CO₂ capture process. Responsibilities included conceptual design, project definition, performance modeling and plant performance evaluation, capital cost estimating, and feasibility evaluation.

CO₂ Capture and Compression Preliminary Design and Estimating, Powerspan Corporation

Texas | 2008

Lead project development engineer. Feasibility evaluation for the implementation of CO₂ capture and compression at the proposed 800 MW supercritical pulverized coal Tenaska Trailblazer Energy Center. Provided plant integration and balance of plant design support to Powerspan Corp. for the addition of their CO₂ capture and compression facility to the proposed 800 MW unit. Responsibilities included conceptual design, project definition, performance modeling and plant performance evaluation, capital cost estimating, and feasibility evaluation.

CO₂ Capture and Compression Preliminary Design and Estimating, Powerspan Corporation

North Dakota | 2008

Lead project development engineer. Feasibility evaluation for the implementation of CO₂ capture and compression at the existing 450 MW subcritical lignite fired pulverized coal Antelope Valley Station. Provided plant integration and balance of plant design support to Powerspan Corp. for the addition of their CO₂ capture and compression facility to the proposed 800 MW unit. Responsibilities included conceptual design, project definition, performance modeling and plant performance evaluation, capital cost estimating, and feasibility evaluation.



DOUG RANDALL, PE

Lead Process Engineer



Doug works as a Lead process Engineer for Burns & McDonnell. He is involved in projects relating to wastewater treatment, DSI injection and other chemical process aspects of air pollution and water treatment for power stations. Doug supports air and water pollution control projects taking into consideration the relationship between the air pollution control technologies and the subsequent wastewater treatment technologies. Doug has previously supported the preparation of permit applications for new and modified air pollution sources under state and federal New Source Review and PSD permit programs. Doug has assisted

on matters requiring regulatory analysis and interpretation. In this capacity, he is involved in preparation of Best Available Control Technology (BACT) and Maximum Achievable Control Technology (MACT) analyses. Doug is familiar with flue gas desulfurization (FGD) process chemistry, with additional experience in permit application and regulatory analysis. Doug's FGD system experience includes work with FGD waste treatment, wastewater treatment and processes and equipment for systems based upon natural oxidation, forced oxidation, and inhibited oxidation. As part of control technology reviews for BACT analyses, Doug has reviewed the development of post combustion NO_x control techniques including selective catalytic reduction (SCR) and various combined SO₂/NO_x control technologies. Doug has performed the evaluation of candidate technologies for specific applications at utility plants considering new or retrofit FGD installations. Doug has also performed the evaluation of candidate technologies for the elimination or treatment of FGD wastewater and miscellaneous other wastewater streams to minimize site discharges, comply with mercury emission limitations, or comply with the Effluent Limitation Guidelines (ELG).

EDUCATION

Bachelors, Chemical Engineering,
2000

23 YEARS OF EXPERIENCE

Carbon Capture | Rainbow Energy Center

Rainbow Energy/EERC Underwood, ND | August 2022-Present

FEED Study for outside boundary limits systems and equipment for a Carbon Capture Facility at both Units at Rainbow Energy Center. The project includes preliminary design, model development, procurement and construction package development, and cost estimate development for the outside boundary limit systems and equipment for the Project. The systems and equipment include modifications to the river water system; a new cooling water loop, cooling tower, and circulating water pumps; steam lines and condensate return lines between the existing facility and carbon capture island; flue as ductwork and ductwork support structures; warehouses; and connection of multiple plant utility systems.

ELG Compliance | Confidential Client

Multiple Confidential sites | 2023-Present

Lead process engineer for multiple sites reviewing how to manage wastewater from multiple ponds that will be shutting down or leachate from landfills that are or soon will be closed down. Evaluations include identifying multiple handling approaches from direct discharge, physical/chemical treatment, biological treatment, and multiple zero liquid discharge options. Discuss the pros/cons of these options and for options deemed worthy of further review, development of Class 5 and 4 cost estimates.

DOUG RANDALL, PE (continued)

Gas Conversion/Co-firing | Multiple Clients

Multiple Sites | 2020-Present

Lead process engineer for multiple sites reviewing the potential impacts on AQCS equipment at a coal fired facility when the unit is firing 100% natural gas or cofiring up to 100% natural gas. Evaluations include identifying what AQCS equipment must remain in operation, benefits/costs of operating existing equipment, identification of necessary modifications, determination of any waste byproducts produced under these future conditions. If byproducts are produced, evaluate how the existing waste treatment systems will operate and discuss the environmental impacts of the waste stream with and without future treatment.

ELG Compliance | Wisconsin Electric Cooperative

Elm Road | 2020-Present

Lead process engineer for now Engineer/Procure/Construct (EPC) project to reuse existing treatment system to achieve ELG limits for FGE wastewater and existing limits for low volume waste through the modification of the existing physical, chemical treatment system, addition of biological treatment for FGD wastewater and additional filtration for low volume wastes. Project began with an ACCE Class 4 cost estimate to evaluate ELG compliance costs to achieve selenium removal, stream concentration, and zero liquid discharge conditions. This evaluation included reviewing options to treat after an existing treatment system and options to the chloride concentration in the scrubber to minimize the overall treatment rate. Options evaluated included biological treatment, zero valent iron, membrane concentration, brine concentration and/or crystallization, and slip stream evaporators.

SCS - PLANT BOWEN WWT 2020 | Georgia Power Co.

Euharlee, Georgia | April 2019 - Sep 2021

Project team. Perform an ACCE Class 3 cost estimate to evaluate compliance costs to achieve metals removal, including selenium, to maintain the anticipated effluent limitation guidelines limits on FGD blowdown. This evaluation included reviewing options to reuse existing treatment equipment to minimize capital cost and increase the chloride concentration in the scrubber to minimize the overall treatment rate. The evaluation reviewed both operating practice changes to increase chlorides as well as a review of the fuels utilized to determine the fuels driving the equipment sizing. Project Resulted in estimating an EPC price for the project for the client to use for budgeting/planning.

Water Redirect and FGD Wastewater Treatment | Duke Energy.

Midwest, South Carolina and Florida | 2015-2019

Lead process engineer for a fleet modification of management and pollution control of wastewater at eight plants and FGD blowdown treatment at five plants. The water reduction portion of the project included the redirection of numerous wastewater streams to new settling ponds and associated chemical treatment to address the closure of existing ponds and the addition of remote submerged flight conveyors (SFC). The FGD blowdown treatment included the specification, bid, award and contract management of three physical chemical and biological treatment system and two ultrafiltration systems at existing biological treatment facilities.

Spurlock CCR/ELG Compliance Project | East Kentucky Power Cooperative

Maysville, Kentucky | 2017 - Present

Project Consultant. Performed original planning study to select FGD wastewater treatment system, including evaluation of options to limit scrubber wastewater. Consulted with lead process engineer on the execution project. The project scope includes treatment of Units 1 and 2 flue gas desulfurization (FGD) process flows, new fly ash handling and storage silo for



DOUG RANDALL, PE (continued)

Units 1 & 2, bottom ash conversion from “wet sluicing system” to “dry” handling system, ash pond closure by removal, and establishment of a new water mass balance (WMB) pond to aid in water quality.

Regional Haze Compliance | Minnkota Power Cooperative, Inc.

Center, North Dakota | May 2018 - Present

Project Lead. Performed a Regional Haze evaluation of steps 1 through 4 for the reduction of NO_x and SO₂ emissions from the two units at Milton R. Young for the purposes of submitting the report to the state and supporting the client responding to comments. Supported the client in coordinating with equipment suppliers to perform boiler testing so that boiler specific performance and costs could be developed for this report. Coordinate with scrubber suppliers to provide site specific scrubber upgrade options and costs. Evaluated the vendor information and included balance of plant cost estimate to provide a 'fully installed' cost estimate and associated dollars-per-ton removal cost for each technology.

Merom Generating Station Industrial Water Treatment Plant | Hoosier Energy Rural Electric Cooperative, Inc.

Merom, Indiana | Sep 2013 - Feb 2017

Lead process engineer. Worked on the specification, bid, award and contract engineering of a physical chemical treatment facility for the all the process waste water discharge of a 2x500-MW facility. Developed technical specifications for final system, evaluated bids and recommend contract award. Coordinate the review and tracking of drawings to ensure that submittals meet the specification. Coordinated with contractor and owner on questions and clarifications during project.

Merom Generating Station U1 ACI Silo | Hoosier Energy Rural Electric Cooperative, Inc.

Merom, Indiana | Oct 2013 - Apr 2016

Project manager and lead process engineer. Worked on the budgetary cost estimate for standalone or a common activated carbon system for 500-MW units. Coordinate equipment location with the client, and coordinate discipline engineers to estimate site specific quantities for a detailed estimate of an installed cost.

SCR Upgrades, Merom Station | Hoosier Energy Rural Electric Cooperative, Inc.

Indiana | Jan 2012 - Jun 2015

Contract engineer. Worked on the installation of SCR on two 500-MW units. Reviewed and tracked drawings to ensure submittals meet the specifications and are returned in a timely manner. Coordinated with contractor on questions and clarifications during project.

ESP Rebuild Project | Hoosier Energy Rural Electric Cooperative, Inc.

Merom, Indiana | Feb 2010 - Dec 2014

Project manager and lead process engineer. Worked on the replacement of ESP on two 500-MW units. Developed and issued specifications, evaluated bids and recommended contract award. Developed technical specifications for final system, evaluated bids and recommend contract award. Coordinate the review and tracking of drawings to ensure that submittals meet the specification. Coordinated with contractor and owner on questions and clarifications during project.

Dry Sorbent Injection Evaluation and Award | Hoosier Energy Rural Electric Cooperative, Inc.

Indiana | Feb 2010 - Dec 2013

Project manager and lead process engineer. Worked on the addition of a dry sorbent injection system on two 500-MW units. Evaluated potential vendors and participated in on-site sorbent injection testing and data analysis. Developed technical specifications for final system, evaluated bids and recommend contract award. Coordinate the review and tracking of

DOUG RANDALL, PE (continued)

drawings to ensure that submittals meet the specification. Coordinated with contractor and owner on questions and clarifications during project.

Dendron Site Rail Traffic Impact Study | Old Dominion Electric Cooperative

Virginia | Jun 2007 - Dec 2012

Project team. This rail impact study was related to the proposed construction of a new coal-fired power generating facility near Dendron, Virginia. The purpose of the study was to determine the effects that proposed at-grade rail crossings would have on the local roadway network. Performing BACT and MACT analysis for the preparation of PSD permit application and state permit applications for two 750MW coal fired units. The analyses included determining BACT and MACT emission rates for a PC boiler firing bituminous coal and blending renewable resource fuels.

Confidential Project | Confidential Client

Confidential Location | Feb 2010 - Apr 2012

Project team. Alliant's Edgewater Generating Station AQCS projects included the retrofit of a dry scrubber, fabric filters and flue gas fans for the coal-fired Units 4 & 5, approximately 350 MW each. Performed SO₂ BACT analysis for an existing 430 MW Unit for the consideration of the Client regarding future SO₂ control plans. Separately, performed an analysis of emission and fuel data of existing semi-dry FGD systems for the Client's submission to the U.S. EPA demonstrating what emission rates and control levels have been maintained in practice.

Cooper Power Station | City of Kansas City, Missouri

Kansas City, Missouri | Jan 2011 - Jan 2012

Project team. Performed computer fluid dynamic modeling of the forced draft fan outlet air flow through a new slip stream duct and to the air heater. Minimize pressure drop between the forced draft fan and the air heater will maintaining sufficient air flow to the slip stream duct. Indian River | Indian River Power, LLC

Compliance Option Study | Northern Indiana Public Service Company, Inc.

Jun 2009 - Oct 2011

Project team. Updated previous multi-pollutant control study requirements on electricity generating units. Developed a program to determine the lowest cost compliance options across multiple units accounting for capital, operating cost estimates and multiple compliance methodologies. Evaluated allowance trading across systems of seven boilers or less.

Overfire Air Retrofit, Laramie River Station Units 1, 2 & 3 | Basin Electric Power Cooperative

May 2008 - Jul 2010

Project team. Performed computer fluid dynamic modeling of the duct work for a new overfire air system. Developing turning vanes to minimize pressure drop and confirm flow distribution.

BACT Analysis, NextGen Project | Basin Electric Power Cooperative

Sep 2006 - May 2010

Project team. Performed BACT analysis for the preparation of PSD permit application and state permit applications for one 700MW coal fired unit. The BACT analysis included determining BACT emission rates for a PC boiler firing PRB coal.



DOUG RANDALL, PE (continued)

Cholla Station Unit 3&4 AQCS Project | Cholla Environmental Partners

Mar 2006 - Jan 2010

Project team. Performed computer fluid dynamic modeling of the duct work from the air heater outlet to the stack. Developed turning vanes to minimize pressure drop and improve flow distribution at the inlet of control equipment.

Thomas Hill Environmental Controls Retrofit Project | Associated Electric Cooperative Inc.

Missouri | May 2005 - Sep 2008

Contract engineer. Worked on the retrofit of an ESP on a 670-MW unit. Wrote specifications and bid documents. Reviewed initial bids for required changes and clarifications. Reviewed and tracked drawings to ensure specifications are met and submittals are returned in a timely manner.

Big Stone II, Otter Tail Power | Otter Tail Power Company

Jun 2004 - Jul 2008

Project team. Evaluated FGD system bid proposals for Big Stone II power plant project.

Multi-Pollutant Control Study | Northern Indiana Public Service Company, Inc.

Sep 2005 - Nov 2007

Project team. Reviewed the impact of pending air quality regulations and proposed multi-pollutant control legislation on electricity generating units. Developed capital and operating cost estimates for various compliance scenarios. Studies evaluated systems consisting of between four and eleven boilers.

Multi-Pollutant Control Study | San Miguel Electric Cooperative, Inc.

Aug 2005 - Sep 2007

Project team. Reviewed the impact of pending air quality regulations and proposed multi-pollutant control legislation on electricity generating units. Developed capital and operating cost estimates for various compliance scenarios. Studies evaluated systems consisting of between four and eleven boilers.

Multi-Pollutant Control Study | Vectren Corporation

May 2004 - Aug 2007

Project team. Reviewed the impact of pending air quality regulations and proposed multi-pollutant control legislation on electricity generating units including A.B. Brown, F.B. Culley and Warrick Generating Station. Developed capital and operating cost estimates for various compliance scenarios. Studies evaluated systems consisting of between four and eleven boilers.

Nelson Dewey Generation Station Unit 3 | WISCONSIN POWER AND LIGHT COMPANY

Oct 2005 - May 2007

Project team. Performed BACT analysis for the preparation of PSD permit application and state permit applications for two 300MW coal fired units. The BACT analysis included determining BACT emission rates for a PC boiler firing PRB coal and renewable resource fuels and a CFB boiler firing bituminous coal, PRB coal, petroleum coke and up to 20% renewable resource fuels.



DOUG RANDALL, PE (continued)

Limestone Electric Generating Station | GENON ENERGY INC

Apr 2002 - Feb 2007

Project team. Study to determine the cause of a recent increase in opacity. Created a report that recommended tests that could be run to determine the source of the opacity increase and possible scenarios to reduce opacity without reducing load.

SCR Installation Project | City of Henderson, Kentucky

May 2001 - Jan 2007

Contract engineer. Worked on the installation of SCR on two 180-MW units. Wrote specifications and bid documents. Reviewed initial bids for required changes and clarifications. Reviewed and tracked drawings to ensure specifications are met and submittals are returned in a timely manner.

Contract Consulting | City of Springfield, Missouri

Apr 2005 - Dec 2006

Project team. Reviewed contract specifications and client/contractor correspondence and documentation. Prepared a report for use in an arbitration regarding an unresolved contract dispute between the client and a third-party contractor.

Confidential Project | Confidential Client

Confidential Location | May 2004 - Jun 2006

Project team. Reviewed the impact of pending air quality regulations and proposed multi-pollutant control legislation on electricity generating units. Developed capital and operating cost estimates for various compliance scenarios. Studies evaluated systems consisting of between four and eleven boilers.

BACT Analysis | The ERORA Group

Feb 2001 - Dec 2005

Project team. Performed BACT analysis for the preparation of PSD permit application and state permit application for two 500MW coal fired units.

Multi-Pollutant Control Study | Hoosier Energy Rural Electric Cooperative, Inc.

Sep 2004 - Aug 2005

Project team. Reviewed the impact of pending air quality regulations and proposed multi-pollutant control legislation on electricity generating units. Developed capital and operating cost estimates for various compliance scenarios. Studies evaluated systems consisting of between four and eleven boilers.

Coronado Generating Station | Salt River Project

Jan 2002 - Sep 2003

Project team. Study of SO₂ removal enhancement alternatives for estimated future regulatory legislation compliance.

Feasibility Study | Vectren Corporation

Aug 2001 - Dec 2002

Project team. Feasibility study for conversion of FGD system at A.B. Brown Units 1 and 2 from dual alkali to lime or limestone process. Estimated operation and maintenance costs for new FGD system.



Timothy E Thomas
Senior Vice President & Deputy General Manager
Engineered Systems Division
Mitsubishi Heavy Industries America

Overview

Mr. Thomas is currently Senior Vice President & Deputy General Manager for the Engineered Systems Division of Mitsubishi Heavy Industries America (MHIA) in Houston, TX and oversees MHIA's CO₂ capture business for North America. He is responsible for safety, business development, project development and implementation from initial concepts, feasibility studies, and FEED studies through project completion. Mr. Thomas has over 38 years of related experience including CO₂ capture systems (CCS), flue gas desulfurization (FGD) systems, material handling systems, wastewater treatment systems, and particulate removal systems.

Project Specific Experience

Directs and oversees the preparation of multiple detailed studies for the application of MHIA's CCS including FEED studies for Prairie State and San Juan power plants. Primary focus on the application and feasibility of installing CCS on power and industrial flue gas sources.

- Project Director from 2002 to 2013 for the design, procurement, construction, and commissioning of FGD systems at multiple TVA fossil fuel power plants. These installations completed on schedule and within budget and valued at over \$1 billion were provided to TVA through Advatech, a joint venture of URS and MHIA.
- Project Engineering Manager during the \$340 million FGD system retrofit for Pennsylvania Electric's Conemaugh Station Units 1 and 2. Managed development of systems design; design criteria; process and instrumentation diagrams; design calculations and equipment optimization; operating procedures and system descriptions.
- On-site Resident Engineer for the construction of JEA/FPL's St. Johns River Power Park, two 600 MW coal-fired generating units. Oversaw the installation of the FGD systems, electrostatic precipitators, and a wastewater treatment facility.

Specialized Training

BS / 1983 / Mechanical Engineering / University of Florida

Chronology

Mitsubishi Industries America, Inc. – Senior Vice President, Vice President, Deputy General Manager, Engineered Systems Division, 2013 to present
URS Corp. and Advatech LLC, Vice President, Project Director, Project Manager, 1996 – 2013
URS - Raytheon Engineers and Constructors – Ebasco Services, Project Engineering Manager, Principal Mechanical Engineer, Senior Mechanical Engineer, Mechanical Engineer, Sr. Associate Engineer, 1983 - 1996

Name : **Hiroataka Tanaka**

Position in this Project : **Engineering Manager**

The Engineering Manager will be responsible for managing all engineering activities required for the scope of work and will report to the Project Manager. The Engineering Manager will review and approve key engineering documents, technical bid summaries and design specification summary sheets. He will work closely with lead discipline engineers to ensure that the engineering work is completed in an integrated team approach to OWNER's satisfaction.

Criteria for Qualification

- Specialty in Process Engineering mainly for Petrochemical Plants and Fertilizer from the Front-end Engineering to the Pre-commissioning and Start-up Supervision
- Project Management Professional (PMP) Certification #2041397 from May 2017 to May 2026 by Project Management Institute Inc., U.S.A.

Summary of Experience

Fifteen (16) years experiences with Mitsubishi Heavy Industries Group which includes Process Design of Petrochemical Projects and Project Management of After Service Projects.

- Process Engineer for seven (7) years
- Assistant Engineering Manager for three (3) years
- Engineering Manager three (3) year
- Project Manager on After Service Projects for three (3) years

Languages

Japanese : Native
English : Fluent

Education

Education : Fukuoka University
Qualification : Bachelor of Chemical Engineering
Joined MHI : April 1, 2007

Personal Data

Nationality : Japanese

Date of Birth : April 4, 1984

Position in MHI's Organization : **Engineering Manager,
Project Department**

Mr. Tanaka's Significant Experience

Engineering Manager (REC-CCS FEED)

- CO2 Capture Plant

North Dakota, USA

2022 - Present

CLIENT: Energy and
Environmental Research
Centre • University of North
Dakota
ENDUSER: Rainbow Energy
Centre

Capacity : 26,800 TPD (13,400 TPD/ 2 Trains)

Scope of work is front end engineering design.

Engineering Manager (Proposal Work)

- Chemical Plan Project

Overseas

2020 - 2022

Capacity : NA

Project Manager (After Service Projects)

- After Service Projects on Methanol Plant (Saudi Methanol Company, AR-RAZI)
- After Service Project on Methanol Plant (Methanol De Oriente, METOR, S.A.)

- Al-Jubail, Saudi Arabia
- Jose, Venezuela

2018 - Present

Capacity : NA

Equipment Replacement Projects on Methanol Plant, including Basic / Detailed Engineering, Procurement, Construction and Commissioning Supervision.

Process Design Package (PDP) Work on Methanol Plants.

Operation Supervisor (OSF)

- Fertilizer Complex
 - Ammonia
 - Urea
 - Utility and Off-site

Sohar Industrial Area, Oman

for Sohar International Urea &
Chemical Industries S.A.O.C.
(SIUCI)

2009

Capacity : 2,000 T/D (Ammonia Plant)
1,750 T/D (Urea Plant) x 2 trains
Grassroots utility and off-site facilities

Lump Sum Turn Key Basis, including Engineering, Procurement, Civil Works and Construction Works, with two years warranty period.

Assistant Process Engineer (TAF Early Work)

- Fertilizer Complex
 - Ammonia
 - Urea
 - Methanol
 - Utility & Offsite

Tatarstan Republic, Russia

for Ammoni

2008

Capacity : 2,050 T/D (Ammonia)
2,050 T/D (Urea)
668 T/D (Methanol)

Process Design Package

Assistant Process Engineer (SPOX)

- Polyethylene (LDPE)
(LLDPE / Metallocene LLDPE): Poly & Fin
Polypropylene (PP)
(Homo Polymer): Fin only

Jurong Island, Singapore

for ExxonMobil Chemical
Company

2007 – 2009

Capacity : 650,000 T/Y × 2 (PE)
450,000 T/Y (PP)

Detailed Engineering, Procurement, Civil Works and Construction Works

Name : **Takashi Kurioka**

Position in this Project : **Project Manager**

The Project Manager will be assigned to direct and control all project activities through all phases of the Project. Project Manager will be responsible for execution of the contract to highest level of safety and quality, adherence to specified design requirements and compliance with the project schedule and budget. His principal duties include maintaining close liaison with OWNER's Project Management Team and coordinating all task force work to meet the criteria of job quality.

Criteria for Qualification

- Five (5) years Piping Section management experience
- Thirteen (13) years Project management experience for Process Plants
- Nine (9) years Piping Design experience for Process Plants
- Six (6) years system development for Piping Design (including CAD)
- Hazardous Material Officer, Class B, Group 4
(He can handle Flammable liquids, gasoline, alcohols, kerosene, light oil, heavy oil, animal fats and vegetable oils)
- Internal Quality Auditor for ISO 9001
- Pollution Control Manager (Vibration), in Japan
- High Pressure Gas Safety Manager (Class A, Mechanical) in Japan
- Professional Engineer ("PE") in 2003, certified by Oregon State, USA

Summary of Experience

Thirty-three (33) years experience with Mitsubishi Heavy Industries Group, served as Piping Engineer. Specialist for Piping Technical Analysis, System Development, Assistant Project Manager and Spatial Engineering Manager, and Project Manager.

Languages

Japanese : Native

English : Business-level

Score of the Test of English for International
Communication (TOEIC) is 700

Personal Data

Education : Waseda University
Qualification : Bachelor of Mechanical Engineering
Joined MHI : April 1, 1990

Personal Data

Nationality : Japanese
Date of Birth : January 1, 1968

Position in MHI's Organization : **Senior Project Manager,
Project Department
Engineering Solutions**

Mr. Kurioka's Significant Experience

Project Manager (REC-CCS)

- CO2 Capture Unit

North Dakota, USA

2022 - present

for Energy and Environmental
Research Centre • University
of North Dakota
END USER: Rainbow Energy
Centre

Capacity: 26,800 T/D (13,400TPD/ 2 Trains)

Scope of work is front end engineering design.

Project Manager (TGF)

- Fertilizer Complex
 - Ammonia
 - Urea
 - Urea(Granulated)

Garabogaz, Turkmenistan

for Turkmenhimiya (TH)

2013 - present

Capacity: 2,000 T/D
3,500 T/D
3,500 T/D

Scope of work is basic design, detail design, procurement and construction.

Section Manager, Yokohama Plant Layout & Piping Engineering Section

- Responsible for all Plant Layout & Piping Engineering Activities, including authorization of documents, cost estimation for bidding projects, personnel's mobilization, etc.

Management in MHI

2012 - 2013

Group Manager, Piping Engineering Group

- Responsible for all Piping Engineering Activities, including authorization of documents, cost estimation for bidding projects, personnel's mobilization, etc.

Management in MHI

2009 - 2012

Spatial Engineering Manager (SPOX)

- Polyethylene

Jurong Island, Singapore

2007 - 2009

Capacity : 650,000 T/Y × 2

for ExxonMobil Asia Pacific Pte. Ltd.

Scope of work is basic design, detail design, procurement and construction.

Piping Engineer (Proposal Work)

- Polyethylene

Singapore

2006 – 2007

Capacity : N.A.

Assistant Project Manager (MMPE)

- Polyethylene

Coatzacoalcos, VER Mexico

2005 – 2006

Capacity : 300,000 T/Y

for Petroquimica Morelos, S.A. de C.V.

Scope of work is basic design, detail design, procurement and construction

Lead Piping Engineer (MMPE)

- Polyethylene

Coatzacoalcos, VER Mexico

2003 - 2004

for Petroquimica Morelos, S.A. DE C.V.

Capacity : 300,000 T/Y

Scope of work is basic design, detail design, procurement and construction.

Piping Engineer (BAPE)

- Cryogenic Ethylene & Propylene Receiving and Storage Facility
1996 – 1998
- Batangas, Philippines
for J.G. Summit Petrochemical Corp.

Capacity : Ethylene 15,000 Ton
Propylene 18,000 Ton

Lump Sum Turn Key Basis, including Basic / Detailed Engineering, Procurement, Construction, Commissioning Assistance and Training

Piping Engineer (BAPE)

- Polyethylene (L-LDPE/HDPE)
1996 – 1998
- Batangas, Philippines
for J.G. Summit Petrochemical Corp.

Capacity : 87,500 T/Y x 2

Lump Sum Turn Key Basis, including Basic / Detailed Engineering, Procurement, Construction, Commissioning Assistance and Training

Technical Specialist for Piping

- Specialist for Technical Analysis, including Piping Flexibility and Stress Analysis, Piping Steady State Flow Analysis, Discharge Noise Arise from Venting Analysis

1993 - 1996 , 1998 - 2003

- Specialist for System Development. Including Two / Three Dimensional Computer Aided Design (AutoCAD / Intergraph PDS), Piping Material Control System which covers Material Takeoff, Purchasing and Control (Intergraph Marian)

1993 - 1996 , 1998 - 2003

Piping Engineer (MJP)

- Polyethylene (L-LDPE/HDPE)

1992 - 1993

Pasir Gudang, Johor Bahru,
Malaysia

for Titan Polyethylene
(Malaysia) Sdn. Bhd.

Capacity : 200,000 T/Y

COC, Fixed Lump Sum Basis, including Basic / Detailed Engineering, Procurement,
Construction and Commissioning Assistance

Assistant Piping Engineer (LL1)

- Polyethylene (L-LDPE/HDPE)

1990 - 1992

Oita, Japan

for Showa Denko K.K.

Capacity : 60,000 T/Y

Lump Sum Turn Key Basis, including Basic / Detailed Engineering, Procurement,
Construction and Commissioning Assistance

Summary

Mr. Lauzze has 18 years of experience in the heavy industrial and power generating industry. He has recent experience managing large engineering and construction projects at both power plants and industrial facilities. He currently serves as the project directory for several active CO₂ capture projects, including FEED studies at coal plants, gas plants, and industrial facilities. He is also currently the project director for the detailed design and installation of multiple CO₂ capture pilot projects. Mr. Lauzze also was the Project Manager for the design and installation of the Wyoming Integrated Test Center and worked on the Petra Nova project from the development phase through the start-up and optimization phase directly supporting NRG and Parish Station.

Education

Illinois Institute of Technology – B.S. Chemical Engineering – 2003
Illinois Institute of Technology – M.S. Chemical Engineering – 2005

Registrations

Professional Engineer – Illinois, Michigan, and Wyoming

Proficiencies

- CO₂ Capture Systems
- FEL and FEED Study Execution
- Transition from FEED and Large Project Execution

Responsibilities

Mr. Lauzze is responsible for S&L's CO₂ capture business development and technical oversight of all of Sargent & Lundy's CO₂ Capture, Transport, and Utilization projects. This includes overseeing regular Communities of Practice (COPs) to ensure that company wide knowledge sharing is occurring to improve the overall design effort on all CCUS projects. In addition, as a Project Director Mr. Lauzze is ultimately responsible for the oversight and overall direction of projects that are executed under him.

Sargent & Lundy Experience

Project Tundra

- 2022 – Present | Owner's Engineer for MHI FEED, Project Director
- 2023 - Present | Air Permit Development, Project Director

Heidelberg

- 2022 - Present | Mitchell Cement Kiln CO₂ Capture Pre-FEED Study, Project Director
- 2024 - Present | Mitchell Cement Kiln CO₂ Capture FEED Study, Project Director

LafargeHolcim

- 2023 - Present | Exshaw Cement Kiln CO₂ Capture Pre-FEED Study, Project Director

Membrane Technology and Research (MTR)

- 2021 – Present | Large Scale Pilot Phase 3 Execution, Project Director
- 2019 - 2021 | Large Scale Pilot Phase 2 FEED Study, Project Director
- 2019 - 2023 | Full Scale CO₂ Capture FEED Study at Dry Fork Station, Project Director
- 2020 - 2022 | CO₂ Capture Pre-FEED Study at Balcones Cement Plant, Project Director

ION Clean Energy

- 2021 - Present | Delta Energy Center FEED Study, Project Director
- 2020 - 2023 | Project Enterprise Pilot Integration at Los Medanos, Project Director
- 2019 – 2021 | C3DC2 FEED Study at Gerald Gentleman Station, Project Director
- 2019 - 2020 | C3DC1 Pre-FEED Study at Gerald Gentleman Station, Project Director

Next Carbon Solutions

- 2022 - Present | Elk Hills Power Plant CO₂ Capture FEED Study, Project Director
- 2021 - 2022 | Rio Grande LNG CO₂ Capture FEED Study Validation, Project Director

Global Thermostat

- 2021 – Present | DAC+ FEED Study ISBL Engineer, Project Director
- 2021 - 2022 | CDAC System Evolution Design Support, Project Director
- 2020 – 2022 | Engineering and Construction Support for DAC2K Pilot System, Project Director

Dakota Gasification Company

- 2022 – 2023 | CO₂ Compressor Expansion Study, Project Director
- 2021 - 2024 | Supercritical CO₂ Pipeline FEED Study and Detailed Design, Project Director
- 2021 – 2024 | Supercritical CO₂ Pipeline Construction Oversight, Project Director

Confidential CO₂ Capture Projects

- 2023 – Present | OE for Chilled Ammonia CO₂ Capture Project, Project Director
- 2022 – Present | CO₂ Compression Feasibility Study for Midstream Client, Project Director

- 2022 – Present | Feasibility Study for Coke Making Client, Project Director
- 2022 – Present | Feasibility Study for Cement Client, Project Director
- 2022 – Present | Feasibility Study for Gas Boiler, Project Director
- 2022 – Present | Feasibility Study for Cement Client, Project Director
- 2022 – 2022 | CO₂ Compression Feasibility Study for Midstream Client, Project Director
- 2022 – Present | Feasibility Study for Cement Client, Project Director
- 2022 – Complete | Feasibility Study for Oil Field, Project Director
- 2021 – Complete Feasibility Study for Cement Client, Project Director
- 2021 – Complete | Feasibility Study for Cement Client, Project Director
- 2021 – Complete | Pre-FEED Study for Cement Client, Project Director
- 2021 – Complete | Feasibility Study for LNG Client, Project Director
- 2021 – Complete | Feasibility Study for LNG Client, Project Director
- 2021 – Complete | Pre-FEED for Oil and Gas Processing Facility, Project Director

Jupiter Oxygen

- 2020 - 2021 | Dave Johnson Oxycombustion FEED Study, Project Director
- 2018 - 2019 | Dave Johnson Oxycombustion Feasibility Study, Project Manager

NPPD

- 2023 - Present | New Generation Project Development and Conceptual Engineering
- 2022 - Present | Sheldon Bottom Ash Project, Project Director
- 2020 - 2022 | Gerald Gentleman and Sheldon Station ACE Rule Evaluation, Project Director
- 2020 - 2022 | Gerald Gentleman Regional Haze Evaluation, Project Director

Basin Electric | LRS SCR/SNCR Project

- 2018 - 2019 | Start Up and Commissioning services, Project Manager
- 2017 - 2019 | Construction Management, Project Manager
- 2016 - 2019 | SNCR Detailed Design, Project Manager
- 2015 - 2016 | SNCR Conceptual Design, Project Manager
- 2015 - 2016 | SNCR Permitting, Project Manager
- 2017 - present | SCR Detailed Design, Project Manager

Basin Electric | Other Projects

- 2019 - 2020 | Laramie River Station Four Factor Analysis, Project Director
- 2020 - present | Antelope Valley and Leland Olds ACE Rule Evaluation, Project Director
- 2015 - 2019 | Dry Fork Integrated Test Center Detailed Design, Project Manager

- 2015 - 2015 | Dry Fork Integrated Test Center FEED Study, Project Manager
- 2018 - 2019 | Dry Fork SCR Pluggage Study, Project Manager
- 2018 - 2019 | Antelope Valley Four Factor Analysis, Project Manager
- 2018 - 2019 | Leland Olds Four Factor Analysis, Project Manager
- 2018 - 2019 | Dakota Gasification Four Factor Analysis, Project Manager
- 2019 - 2020 | Laramie River Coal Silo Weld Detail Analysis, Project Manager

Genesis Alkali | 2018 - Present

Granger Optimization Project Detailed Design, Project Manager

Carbon Capture Machine | 2018 - 2020

ITC Small Test Center Pilot Skid Design, Project Manager

NRG

- 2022 – Present | Texas NOx Evaluation, Project Director
- 2020 – Present | Walking Surfaces Inspection – Various Stations, Project Director
- 2019 – Present | Illinois Plants CCR Support, Project Director
- 2013 - 2017 | Petra Nova Carbon Capture Project Ductwork Detailed Design and Owner's Engineer, Project Manager
- 2016 - 2017 | Homer City NOx Reduction Upgrades Study, Project Manager
- 2015 - 2016 | Fleetwide ELG Compliance Study, Project Manager
- 2012 - 2016 | Parish, Limestone, and Big Cajun MATS Compliance Detailed Design, Project Manager
- 2015 - 2016 | Big Cajun II Natural Gas Piping Detailed Design, Project Manager
- 2014 - 2015 | Limestone Station New Fuel Evaluation, Project Manager
- 2014 - 2015 | Limestone WFGD Study, Project Manager
- 2013 - 2014 | Keystone Water Reuse Study and Cost Estimate, Engineering Manager
- 2012 - 2013 | Cheswick Bottom Ash and WWT Upgrade Study, Engineering Manager
- 2012 - 2013 | Parish Unit 8 CO2 Capture FEED Study, Mechanical Lead
- 2011 - 2012 | Parish Unit 7 CO2 Capture FEED Study, Mechanical Lead

RRI Energy | 2011

ICR Data Collection for EPA Data Request, Engineering Lead

PGE | 2008-2009

Boardman Station Multi Pollutant Study, Mechanical Engineer

AEP | 2007-2011

Cardinal Unit 3 WFGD Project Detailed Design, Mechanical Engineer and Piping Lead

Various Environmental Project Support | 2005-2007

- CLECO | Baghouse Study
- Dairyland Power Cooperative | Multi-Pollutant Study and Dry FGD Specification
- LCRA | Computational Fluid Dynamic (CFD) Analysis to improve ductwork flow and optimize SO₂ reduction
- Ameren | CFD Analysis to lower pressure drop in ductwork
- PacifiCorp | Baghouse and FGD Study at Naughton and Dave Johnston
- San Miguel | WFGD Upgrade Study

Academic Experience

- Fuel Cell Research Assistant at Illinois Institute of Technology
- PEM Fuel Cell Research, focusing on computer modeling and control
- Lithium Ion Battery Research assistant at Argonne National Laboratory

Publications

- "Comparison of IGCC & Pulverized Coal Technologies," K.C. Lauzze and D.G. Rice, Coal Gen, August 2006.
- "Power Control of a Polymer Electrolyte Membrane Fuel Cell," K.C. Lauzze and D. J. Chmielewski, Industrial & Engineering Chemistry Research, May 2006.
- "Performance of CO preferential oxidation reactor with noble-metal catalyst coated on ceramic monolith for on-board fuel processing applications," R. K. Ahluwalia, Q. Zhang, D. J. Chmielewski, K. C. Lauzze, and M. A. Inbody, Catalysis Today, January 2005, pp 271-283.
- "ZrO₂- and Li₂ZrO₃-Stabilized Spinel and Layered Electrodes for Lithium Batteries," M. M. Thackeray, C. S. Johnson, J. -S. Kim, K. C. Lauzze, J. T. Vaughey, N. Dietz, D. Abraham, S. A. Hackney, W. Zeltner and M. A. Anderson, Electrochemistry Communications September 2003.

Summary

Donna has more than 35 years of experience in mechanical design and engineering of electric power generating stations. Her overall experience encompasses all major plant systems and equipment, including cooling towers, condensers, boiler auxiliary equipment, water treatment, selective catalytic reduction (SCR), compressed air and gas, particulate control, flue gas desulfurization (FGD) and waste fixation, activated carbon injection (ACI), dry sorbent injection (DSI), ash handling and CO₂ Systems. Broadly, Donna's tasks have involved procurement specifications, equipment sizing and layouts, system design documents, and drawings. She has contributed to preliminary design studies to determine plant layout, established system design criteria, sized and specified equipment, prepared flow diagrams and designed piping systems, evaluated proposals and made procurement recommendations, and supporting licensing activities. Recent experience includes the Laramie River Station SCR retrofit for Basin Electric Corporation.

Education

Illinois Institute of Technology – B.S. Chemical Engineering

Registrations

Professional Engineer – Illinois, Wyoming

Proficiencies

- Mechanical engineering and design
- SCR, FGD, ACI, DSI, and particulate emissions control systems
- CO₂ systems
- Material handling
- Water treatment
- Compressed air and gas systems
- Plant Retrofits
- Vendor Contract Management

Responsibilities

Donna's responsibilities focus on coordination of engineering, design, and other supportive specialists within the mechanical discipline to ensure compliance of mechanical project work with client

requirements; national, state, and local regulations; applicable Sargent & Lundy standards and procedures; standard professional practices; and project schedules.

Sargent & Lundy Experience

Emissions Control and Plant Retrofits

Minnkota Power Cooperative

- *Milton Y. Young Station Units 1 & 2* - Mechanical Project Engineer performing Owner's Engineer oversight for a CO₂ Capture Feed Study. Coordinating review of consortium design and interface with the operating station, participating in HAZOPs, P&ID reviews, Model reviews and RAM Studies. (2023 – Present).

Drax

- *Pellet Plant Carbon Capture System (PPCS) Projects* -- Mechanical Project Engineer performing independent reviews of Balance of Plant deliverables for a Pre-FEED study evaluating implementation of a large scale, modular carbon capture utilization and storage system at a biomass facility in Bastrop, Louisiana. (2023).

Membrane Technology & Research (MTR)

- Large Pilot Test Facility - *Mechanical* Project Engineer performing independent reviews of Engineering and deliverables on project to construct a demonstration plant to test MTR's membrane-based post-combustion carbon dioxide (CO₂) capture technology at the Wyoming Integrated Test Center (ITC), located at Dry Fork Station (DFS) Unit 1. (2023).

Dakota Gasification Company

- Mechanical Project Engineer overseeing the preliminary design, cost estimates, and bid evaluation for the addition of CO₂ Compressors to an operating gasification facility. (2022 – 2023)

TransAlta

- Sundance Unit 6, Keephills Units 1 & 2 - Mechanical Project Engineer responsible for Owner's Engineer oversight for EPC Projects converting coal units to operation on natural gas. (2019 – 2021)

Cabot Corporation

- Mechanical Project Engineer for Phase 2 Alternatives Analysis of air pollution control and energy center project for a carbon black facility in Louisiana. The project included conceptual engineering of multiple technologies, conceptual process design, major equipment specification development, project schedule development, cost estimate development, and value engineering for cost reduction. (2019 – 2020)

Basin Electric Power Cooperative (BEPC)

- Laramie River Unit 1 - Mechanical Project Engineer. SCR retrofit, including supervision of mechanical team from conceptual design through equipment procurement, detailed design and installation of selective catalytic reduction system, axial induced draft (ID) fan, compressed air system upgrades, DSI system, dampers and expansion joints. (2014 – 2018)

NRG Energy (Formerly GenOn, and RRI Energy)

- Limestone Units 1&2, WA Parish Units 5,6,7,&8: Mechanical Project Engineer. Prepared studies and cost estimates for replacing bottom ash sluice systems with under boiler conveyors. (2022)
- Limestone Unit 1 – FGD Ductwork Rebuild - Mechanical Project Engineer. Responsible for equipment specifications and engineering involved with replacing piping and equipment damaged due to ductwork failure. (2021-2022)
- Shawville Units 1-4 Closed Cycle Cooling - Mechanical Project Engineer. Prepared several studies for converting open cooling system to a closed system. Responsible for supervision of mechanical team including preparation of cost estimates, system layout, cooling tower and supply pump procurement and intake modifications.
- Conemaugh Units 1-2 - Mechanical Project Engineer. Responsible for supervision of mechanical team for SCR retrofit including preparation of project cost estimate, specification preparation and contract supervision for several auxiliary chemical feed systems and installation contracts. (2010 to 2014)

RRI Energy (Formerly Reliant Energy)

- Shawville Units 1-4, Conemaugh Units 1-2, Titus Units 1-3, New Castle Units 3-5, Portland Units 1-2 - Mechanical Project Engineer. BOP design for Alstom ACI systems, including owner engineering review and coordination responsibilities. (2008 to 2009)
- Shawville Units 3 and 4, Baghouse Project, 326 MW total, coal - Mechanical Project Engineer. Baghouse specification preparation. (2008)
- Shawville 3&4 FGD,SCR, and Cooling Tower Study - Mechanical Project Engineer. Coordinate study to determine equipment layout and cost estimate preparation. (2009)
- Avon Lake Unit 9 Steam Supply Study - Mechanical Project Engineer. Coordinate study to optimal alternative to start up Unit 9 steam turbine driver boiler feed pumps for Unit 7 (steam supply) decommissioning. (2007 to 2008)
- Deer Park Cogeneration Expansion Study - Mechanical Project Engineer. Coordinate study and cost estimate for the addition of a combustion turbine and HRSG to the existing two-unit cogeneration facility. (2007-2008)

NRG Energy

- Indian River Units 1-4, 825 MW total, coal - Mechanical Project Engineer. Prepare cooling tower feasibility study and impingement and entrainment evaluation. (2009)
Mechanical Project Engineer. Pipe routing, design, material specification, owner engineering responsibilities for Unit 3 SO₃ conditioning BOP project. (2009)
Mechanical Project Engineer. System design, specification preparation, contract coordination for Units 1-4 ACI project. (2007 to 2009)
- Parish Station - Mechanical Project Engineer. Dry FGD retrofit specification preparation. (2007)

Duke-Cinergy

- Cayuga Units 1 and 2 Wet FGD Retrofit, 1060 MW total, coal - Mechanical Project Engineer. Detailed design for addition of wet FGDs, including system design, specification preparation, and mechanical design coordination. (2003 to 2006)

Duke-Cinergy

- Cayuga Units 1 and 2 SCR Retrofit, 1060 MW total, coal - Mechanical Project Engineer. Detailed design for addition of SCR system (installation deferred).

Ameren Services

- Coffeen Units 1 and 2; Sioux Units 1 and 2, coal - Mechanical Project Engineer. Conceptual design, equipment procurement and detailed design for addition of SCR system, ductwork, steel, fans, and electrical system. (1999 to 2000)

Southern Company Services

- State Line Units 3 and 4, fossil - Mechanical Project Engineer. Engineering support for fire restoration. Engineering support to repair fire damage, including supervising modifications and testing of fire protection/detection system and expediting the precipitator and induced draft (ID) fan contracts, which were in progress at the time of fire. (1998 to 1999)

Santee Cooper

- John S. Rainey - Mechanical Project Engineer. Conceptual design and equipment procurement for SCR retrofit in Unit 1A and 1B HRSGs, including supply of the ammonia system. (2003 to 2004)

Illinois Power Company

- Baldwin Units 1 and 2, 600 MW each, coal - Mechanical Project Engineer. Conceptual design, equipment procurement and detailed design for replacement/upgrades of air heater, SCR system, ductwork, steel, fans, precipitator, and electrical system. (1996 to 1998)

TU Electric

- Martin Lake Units 1-3, fossil FGD reconditioning. Lead Mechanical Engineer. Design and procurement of dampers and slurry pumps. Prepared studies for equipment replacement alternatives. (1995 to 1996)
- Monticello Unit 3, fossil, 750 MW - Mechanical Engineer. Design and procurement for FGD and ESP rebuild contracts, including reviewing vendor deliverables and supervising the preparation of Sargent & Lundy mechanical drawings. (1994 to 1995)

Skygen Energy LLC

- Corpus Christi Energy Center - Mechanical Project Engineer. Equipment procurement and design for EPC contract for 425-MW combustion turbine combined cycle cogeneration plant with steam sales to a refinery. Scope included 2x2x1 configuration consisting of two "F" technology combustion turbine generators, two natural circulation, duct fired, heat recovery steam generators one extraction steam turbine, and one water cooled surface condenser. (2000 to 2001)

Skygen Energy LLC

- Androscoggin Energy Center - Mechanical Project Engineer. Equipment procurement and detailed design for the addition of a steam turbine to an existing cogeneration facility. Major equipment procurement included condenser to operate in conjunction with a vertical discharge steam turbine, cooling tower and miscellaneous pumps. Work included administering the steam turbine contract and relocation of existing fire protection and natural gas lines. (2000)

PSI Energy

- Wabash River Unit 1, fossil - Mechanical Engineer. Repowering design and procurement of the water treatment system and the preliminary design of condensate system and piping instrumentation drawings.
- Gibson Unit 4, 668 MW, fossil - Mechanical Engineer. Reroute ash handling system associated with FGD retrofit design. Also responsible for maintenance of FGD dewatering process contract. (1991 to 1992)

Missouri Public Service

- Sibley Units 1-3, 459 MW total, fossil - Prepared specifications for sample panels, chemical feed systems, SO₃ conditioning and nitrogen blanketing. Prepared an evaluation of the plant heat tracing system. (1990 to 1991)

Dairyland Power Cooperative

- Genoa Unit 3, 380 MW, fossil - Mechanical Engineer. Closing of ash pond, including preparing and evaluating equipment procurement and erection specifications/bids for bottom ash handling system. Scope included evaluation of existing waste systems and their method of treatment and disposal upon closing of the ash ponds. (1990 to 1991)

Condition Assessment

Missouri Public Service

- Sibley Units 1-3, 459 MW total, fossil - Heat tracing evaluation.

Decatur Memorial Hospital

- Performed condition assessment of major hospital utility systems, e.g., steam, air, water, power, etc. Developed recommendations for modifications and improvements to existing systems. (1989)

Cincinnati Gas & Electric Company

- Miami Fort 5 - Assessment of sampling and chemical feed system. (1988)

Studies

GDS

- Prepared a report detailing the expected maintenance costs associated with a power plant over a given life span. This study was prepared for an investment firm evaluating the purchase of an existing fossil station. (1990)

Wisconsin Public Service Corporation

- Pulliam 3-5 - Mechanical Engineer. Assisted in evaluation of multiple repowering options. (1990)

Publication

- "Interim Consensus Guidelines on Fossil Plant Cycle Chemistry," (contributing investigator) Electric Power Research Institute, June 1986.

Rafay Anwar P.Eng.

VICE-PRESIDENT PROJECT DEVELOPMENT AND TECHNICAL SERVICES

Rafay guides the engineering and project management teams in project execution and knowledge sharing to support our core value of helping advance the implementation of carbon capture. Rafay has over 16 years of experience in project management and engineering having worked with a variety of stakeholders to successfully execute projects of varying complexity and capital cost. His areas of technical expertise include amine plants, gas compression and dehydration, liquids handling, refrigeration and CO₂ transport.

EXPERIENCE

International CCS Knowledge Centre, Regina, SK

2024-Present

Vice-President of Project Development and Technical Services

- Developing strategic partnerships with other organizations in the carbon capture space
- Resource management including recruitment, training and compensation philosophy
- Growing the group's technical expertise and supporting the Policy, Regulatory and Stakeholder group

International CCS Knowledge Centre, Regina, SK

2023

Director of Project Development and Technical Services

- Lead the Knowledge Centre engineering and management teams in project execution
- Develop project scope for existing and prospective clients
- Provide mentorship and support for team members through formal and informal knowledge sharing

Trilogy Projects Ltd., Calgary, AB

2022

Program Manager

- Develop business for gas processing, liquids recovery and CCS projects
- Project manager for restart of a 50MMSCF/d gas and liquids facility – TAQA North

Gas Liquids Engineering Ltd., Calgary, AB

2007 -2021

Program Manager – Pembina Gas Services

- Client liaison and manager for all projects with company involvement at Pembina's Duvernay facility
- Project manager for a 150MMSCF/d sour gas facility – FEED to first gas completed in 14 months
- Project manager for a 30MMSCF/d gas lift project including dehydration, compression, and sales riser
- Detailed engineering for a greenfield 30 MMSCF/d, 10,000 bbl./d facility – Pembina Midstream

Project Manager – Various Clients

- Project manager for a 100MMSCF/d facility with gas sweetening and liquids storage – ARC Resources
- Project manager for a CO₂ compression, dehydration, transport & sequestration study – Cenovus
- Project manager for a clean energy generation feasibility study with CCS/EOR – Paramount Resources

Project Engineer – Various Clients

- Brownfield engineering for a 50 MMSCF/d gas dehydration and liquids recovery plant – AltaGas
- Detailed engineering for a 30MMSCF/d CO₂ dehydration package – Kinder Morgan
- FEED for a 32,000 bbl./d condensate, NGL, gas compression & storage facility – 7 Generations Energy

EDUCATION

B.Sc., Mechanical Engineering – McGill University

2005

Everett Rueve P.Eng., MBA

Senior Project Manager

Everett has over 25 years in the energy sector, consisting of Oil and Gas refining, Gas to Liquids (GTL) refining, Hydrogenated-Derived Renewable Diesel (HDRD) refining, hydrogen processing (SMR and ATR), crude oil storage terminal operations and pipeline design. Additionally, he has experience with carbon capture utilization and sequestration (CCUS) projects associated with power plants, ammonia facilities, and the cement industry.

EXPERIENCE

Rueve Energy Projects, White City, SK

2021 - Present

Owner & President

- Strategic consultant of creative energy solutions optimizing business development, project development, project management, engineering, and operations
- Project Manager / Mechanical Engineering Specialist for the following CCS Knowledge Centre projects:
 - Rainbow Energy Coal Creek Station CCS Project
 - Owner's technical advisor during Front End Engineering Design (FEED)
 - Nutrien Redwater CCS Project
 - Prefeasibility review of decarbonization options for ammonia production (Blue Hydrogen versus CCS)
 - SaskPower Shand Carbon Capture Test Facility (CCTF) Compression-Dehydration Project
 - Prefeasibility Study, including CAPEX, OPEX, and Levelized Cost of Capture (LCOC) for CO₂ sales
 - Heidelberg Materials Edmonton CCUS Project
 - Optimized Co-Gen heat integration assessing numerous HRSG and OTSG technologies
 - CCUS Client Workshops
 - Present various CCUS technologies and lead the discussion on Blue Hydrogen technologies
- Project Manager for the following Energy Transition projects:
 - Hydrogenated Derived Renewable Diesel
 - Manage the Owner's Engineer during Front End Engineering Design (FEED)
 - Lead RFP development amongst Engineering, Procurement, Fabrication (EPF) firms
 - Hydrogen Power
 - Replace coal fired power production with H₂ fueled gas fired combined cycle technology
 - Aligned the ATR sizing for 300 MW power and engaged GE on H₂ turbine selection
- Project Engineer for the following Energy Transition projects:
 - Blue Hydrogen
 - Prefeasibility Study on a 150 MMSCFD ATR @ >95% CO₂ recovery
 - Sized Utilities (Steam, Air Separation Unit, Cooling Water, etc.)
 - Gas to Liquids
 - Fischer-Tropsch process utilizing inexpensive flared fuel gas as feedstock
 - Analyzed H₂ technology to produce the optimum syn gas characteristic for the FT process

Gibson Energy, Moose Jaw, SK

2010 - 2021

Manager, Project Development and Execution / Technical Services / Senior Refinery Engineer

- Lead and mentored a team of Engineers and Technologists optimizing the Moose Jaw Refinery
- Project managed complex "brownfield" debottleneck capital projects

Co-op Refinery Complex, Regina, SK

1998 - 2010

Major Projects Engineer / Unit Operations Engineer / Plant Engineer

- Major Projects Engineer 2008-2010
 - Project Manager \$250 MM Industrial Wastewater Re-Use - MBR & HERO Technologies
- Utilities Process Engineer 2003 - 2008
 - Optimized Utility Operations - Demin Water, Wastewater, Steam, Cooling Water, Nitrogen
- Plant Engineer 1998 - 2003
 - Managed capital projects for improved reliability and/or increased capacity

EDUCATION

B.Sc., Mechanical Engineering (1998) - University of Saskatchewan

Executive MBA (2013) - University of Regina (Kenneth Levene Graduate School of Business)

Colin Campbell B.Sc. (Hons), PChem

Principal Chemist

Over twenty-five years of experience as a senior technology consultant specializing in research and development, analytical chemistry, instrumentation and controls systems, electronic design, and software development. Colin has expertise developed as a technical lead on the SaskPower Boundary Dam Unit #3 Carbon Capture project. He serves as a subject matter expert on chemical instrumentation and analysis, CCS technologies, flue gas characterization, data analytics, environment emissions monitoring and management, experimental design, and pilot scale testing.

EXPERIENCE

International CCS Knowledge Centre, Regina, SK

2017-Present

Principal Chemist

Flue Gas Characterization

- Provide flue gas characterization support to numerous clients in multiple industries, including Cement, Steel, Fertilizer, Pulp and Paper, Oil and Gas, and Power production.
- Serve as a subject matter expert on flue gas composition and testing methods.
- Deliver workshops on flue gas characterization as it applies to de-risking carbon capture projects.

Pilot Testing Support

- Support a large international hard-to-abate emitter in implementing two separate CCS pilot plants. Assist in the development of pilot testing goals, testing plans and provide on-site support for gas measurement and laboratory method development.
- Assist in designing a customized pilot plant, in particular, in the design of the instrumentation and measurement systems.

Analytical Chemistry Support for Carbon Capture Systems

- Provide support to customers in designing chemical testing laboratories.
- Develop specialized testing methods to de-risk solvent selection and pretreatment requirements.
- Serve as a subject matter expert to multiple clients in a variety of industries on chemical analysis methods to support environmental monitoring and operations.

Advanced Instrumentation Research

- Performed detailed research into new methods of real time chemical analysis for Carbon Capture systems.
- Responsible for developing working prototypes for these proposed analysis systems, including chemical design, electronics design, embedded software design, remote telemetry, cloud-based analysis and reporting tools.
- Included the design of 3D printed laboratory grade laboratory grade prototypes of various piping and instrumentation components and pressurized reaction cells as well as preliminary designs for all electronic control and sensor components.

Development of New Online Analysis Techniques

- Led a collaborative research project between the International CCS Knowledge Center, the University of Regina, and Scion Instruments to develop new instrumentation systems for the online analysis of carbon capture solvents.

Data Analytics

- Provided advanced analytics to a large international customer related to the monitoring and collection of environmental and operational performance data from their power plants. The goal of this work was to understand discrepancies in multi-year data sets and the possible implications to future maintenance and operations of these power generation units.

Saskpower, Regina, SK

2013 -2017

Manager, Chemical Services / Laboratory Modernization/Expansion for CCS

- Accountable for the operation of several advanced chemical laboratories and a staff of twelve chemistry, materials science, and engineering personnel.
- Responsible for the implementation, maintenance, and support of a complex network of diverse IT systems consisting of many specialized pieces of equipment and wide variety of operating systems of various ages.

Yuewu Feng P.Eng., PMP

Senior Engineer

Yuewu joined the International CCS Knowledge Centre in 2018. As a senior engineer, Yuewu applies his expertise, gained from the SaskPower Boundary Dam Unit 3 CCS Initiatives (BD3 CCS project), contributing to basis of design development, design review, knowledge share and cost estimation for the feasibility and front-end engineering study of the carbon capture and storage projects development.

Prior to joining the Knowledge Centre, Yuewu worked 7 years at SaskPower BD3 CCS project. His experience includes request for proposal preparation, proposal evaluation, design review, equipment supply and install contracts management, mechanical commissioning leadership, post-commissioning upgrade study, and operation and maintenance support.

Before getting in CCS field, Yuewu has 18 years in mechanical engineering design, upgrade projects development and implement, operation and maintenance training, and overhaul planning and execution for coal power plants.

EXPERIENCE

International CCS Knowledge Centre, Regina, SK 2018-Present

Senior Engineer

- Basis of design development, technical review, and cost estimation for the feasibility and front-end engineering design study of carbon capture projects developments
- BD3 CCS project knowledge share

BD3 CCS Initiatives, SaskPower, Regina, SK 2011-2018

Senior Engineer/Mechanical Commissioning Lead Engineer/Mechanical Engineer

- Design review, RFP preparation, proposals evaluation
- Equipment supply and install contracts management
- Hazard and operability study (HAZOP) participation
- Mechanical commissioning team leadership including engineers, consultants, and trades; scope, schedule, and resources management
- Pre-commissioning deficiencies resolution with EPC
- Post-commissioning upgrade study, design review, install contract management
- Operation troubleshooting and maintenance planning support

Poplar River Power Station, SaskPower, Coronach, SK 2008-2011

Technical Specialist II (EIT), Mechanical

- Turbine and various mechanical equipment overall plan, implement and shutdown inspection
- Troubleshooting, technical study, and design for plant safety and performance improvement

Thermal Power Institute of Taiyuan Electric Power College, Taiyuan, China 1993-2004

Taiyuan No.1 Power Station, Taiyuan, China 1986-1990

Engineering Vice Director, Mechanical Engineering Team Leader, Mechanical Engineer, EIT

- Power plant design, upgrade project development, design and implement
- Training material development for operation and maintenance
- Simulator development support
- Commissioning participation

EDUCATION

M.Sc., Mechanical Engineering –Dalian University of Technology, Dalian, China

B.Sc., Mechanical Engineering - Taiyuan University of Technology, Taiyuan, China

- Advance chemical analysis capabilities required to support the Boundary Dam unit #3 Carbon Capture project. This involved upgrading one existing laboratory and building a new advanced analysis and research laboratory in Regina, SK, and building two smaller field laboratories at Boundary Dam and Shand power stations in Estevan, SK. I was responsible for all aspects of this project from project initiation to final delivery, acquiring executive sponsors, budgeting, procurement of equipment, management of contractors, hiring and training of new staff. A critical factor in this project was the secure management of vendor intellectual property (IP). This involved developing technological solutions, policies, and procedures to protect vendor IP and ensure the top security of all laboratory information and information systems.

TECHNICAL PUBLICATIONS AND COURSES

- Center, I. C. (2021). Continuous Online Analysis of Amine Solvents Using Gas Chromatography. Retrieved from <https://ccsknowledge.com/pub/Publications/Gas-Chromatography-Report.pdf>
- Idem, R., Supap, T., Shi, H., Gelowitz, D., Ball, M., Campbell, C., & Tontiwachwuthikul, P. (2015). Practical experience in post-combustion CO₂ capture using reactive solvents in large pilot and demonstration plants. *International Journal of Greenhouse Gas Control*, 40, 6-25.
- Nath, D., Campbell, C., Feng, Y., Bruce, C., Philip, F., Henni, A., . . . Janowczyk, D. (2021). A Novel Methodology for Online Analysis of Amine Solution Degradation Caused by Fly Ash. *SSRN Electronic Journal*.
- Shi, H., Supap, T., Idem, R., Gelowitz, D., Campbell, C., & Ball, M. (2017, July). Nitrosamine Formation in Amine-Based CO₂ Capture in the Absence of NO₂: Molecular Modeling and Experimental Validation. *Environmental science & technology*, 51(13),
- Supap, T., Idem, R., Gelowitz, D., Campbell, C., & Ball, M. (2016). Optimizing method parameters for ion pair-based high performance liquid chromatographic analysis (IP-HPLC) for complex amine blend formulas used in post combustion carbon dioxide capture. *International Journal of Greenhouse Gas Control*
- Supap, T., Shi, H., Idem, R., Gelowitz, D., Campbell, C., & Ball, M. (2017). Nitrosamine Formation Mechanism in Amine-Based CO₂ Capture: Experimental Validation. *Energy Procedia*

EDUCATION

B.Sc. (Hons), Chemistry - University of Regina

LRC-104C

Title: “Lignite Conversion Reactor Optimization for Commercial Carbon Pitch Manufacturing”

Submitted By: AmeriCarbon Products, LLC

PM/PI: David Berry

Duration: 18 months

Purpose: AmeriCarbon is proposing to optimize their reactor design as the move toward commercial application in North Dakota. Their technology would make coal tars and pitch for use in production of graphite, asphalt binder, and other carbon materials. The applicant is requesting funding for 18 months to optimize their lignite conversion reactor in parallel to efforts to develop designs for generating the end products. The end goal is to provide design and economic information needed to make a decision for commercialization in North Dakota. The expected outcomes of the project include optimized design and economics for the reactor and increased understanding of the commercial opportunity for North Dakota Lignite.

Funding: NDIC: \$743,809; Total Project Costs: \$1,488,809

Technical Advisor’s Recommendation:

Fund – AmeriCarbon is proposing to optimize their reactor design as the move toward commercial application in North Dakota. Their technology would make coal tars and pitch for use in production of graphite, asphalt binder, and other carbon materials. This project would provide 50% match with in-kind funding from AmeriCarbon and in-kind cost services from North American Coal.

All three of the technical reviewers recommended funding, and the proposal received an average score of 218 out of 250. The project would leverage state funding through funding from the project participants.

Funding would be subject to the following:

- Technical advisor participates in project reviews.
- Technical advisor reviews the project management plan with the project team.

Conflicts of Interest: North American Coal - Falkirk Mine.

Reviewers: Fund - 3; Consider Funding - 0; Do Not Fund – 0

LRC: Fund: Yes - 13; No – 0: Abstain - 1



April 1, 2024

State of North Dakota
The Industrial Commission
State Capitol
Bismarck, ND 58505
ATTN: Lignite Research Program

RE: Transmittal Letter

This transmittal letter is to set forth a binding commitment on behalf of AmeriCarbon Products, LLC to complete the project as described in the accompanying application if the North Dakota Industrial Commission makes the grant requested therein.

Sincerely,

Greg Henthorn
Vice President of Corporate Development
AmeriCarbon Products, LLC



(888) 367-1650



www.americarbon.com



3001 City View Drive
Morgantown, WV 26501

AmeriCarbon Products, LLC
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Morgantown, WV 26501
(888) 367-1650

Clear Mountain Bank
PO Box 205
39 Union Street
Bruceton Mills, WV 26525

No. 1901

69-259/515

Date 4/1/2024

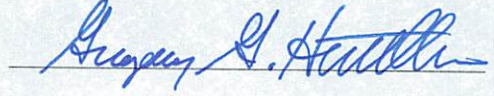
Pay To The Order Of State of North Dakota

\$ **100.00

One Hundred and 00/100

Dollars

Memo: Application Fee



⑈00000 190 1⑈ ⑆05 150 2599⑆ 5000 254 15

1901

Amount: \$100.00

Date: 4/1/2024

Pay to: State of North Dakota

1901

Amount: \$100.00

Date: 4/1/2024

Pay to: State of North Dakota



Submitted To: State of North Dakota
The Industrial Commission
State Capitol
Bismarck, ND 58505
ATTN: Lignite Research Program

Project Title: Lignite Conversion Reactor Optimization for Commercial Carbon Pitch Manufacturing

Applicant: AmeriCarbon Products, LLC

Principal Investigator: David A. Berry

Date of Application: April 1, 2024

Amount of Request: \$743,809



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I. Abstract

The United States is dependent on China for a number of critical materials and supplies that place our nation's economic and defense security at risk. Advanced carbon materials – possessing properties such as possessing high strength-to-weight ratio, flexibility, electrical conductivity, thermal control, chemical resistance, and radar absorption – are playing an increasingly critical role in a number of sectors, including national defense, infrastructure, energy storage, and transportation.

Ironically, the United States is rich in carbon deposits in the form of coal. However, the current industrial process for producing coal tar and coal tar pitch, intermediate forms required to unlock coal's potential for advanced materials applications, is exclusively a ~5% by-product of coking ovens used in steelmaking. Because the United States' steel production capacity has been decimated since the 1980s, our nation's supply chains are unnecessarily dependent on China and other Asian countries for coal tar and coal tar pitch, leaving our national security vulnerable to manipulation and dependence. A major supply shortfall in coal tar pitch has emerged, with market prices increasing approximately 50% in the past year alone; projections suggest these dynamics will only increase for the foreseeable future.

With substantial support from the State of North Dakota and The North American Coal Corporation, AmeriCarbon is at the forefront of efforts to mitigate the carbon materials supply crisis by accelerating the commercial adoption of Eco-Pitch™, an alternative to China-derived coal tar pitch, which will be manufactured in North Dakota using an alternative chemical pathway that does not rely on steel manufacturing. Instead, AmeriCarbon's patented and proprietary non-combustible process uses lignite coal as its primary feedstock, with the flexibility to use different types of coal and the capacity to tailor its operating conditions to produce multiple formulations of its end products to meet specifications for different applications.

AmeriCarbon is entering into its final stage of commercial engineering design & scaleup for its proprietary Liquid Carbon Process to manufacture Eco-Pitch™. Through its numerous internal studies and design efforts, AmeriCarbon has identified an optimized reactor configuration that incorporates specific operational benefits for lignite coals. Prior supported efforts by NDIC, in partnership with North American Coal, have led to valuable insights through the successful conversion of lignite coal into specialty pitches, asphalt, and graphite. These insights will be incorporated into the improved design of an optimized reactor that will be utilized in our planned commercial plant to be located in North Dakota. Within this scope, this innovative reactor will be validated and will generate a variety of lignite-based pitches that will be shared with AmeriCarbon's customer base to generate feedback and expand market base for lignite coal. The proposed \$1,488,809 project (including \$743,809 requested from NDIC) will span 18 months upon initiation and involves the following primary participants: AmeriCarbon Products, LLC (applicant), Worley



Parsons, and The North American Coal Corporation, which have collectively pledged \$745,000 in cost share.

2. Project Summary

AmeriCarbon is working to design, construct, and operate a commercial scale carbon products manufacturing facility in McLean County, North Dakota (“McLean Plant”). The McLean Plant will use North Dakota lignite in AmeriCarbon’s patented and proprietary Liquid Carbon Process to manufacture *Eco-Pitch™*, a 100% domestically sourced alternative to coal tar pitch, a critical supply material for the production of synthetic graphite, asphalt binder, and other carbon materials.

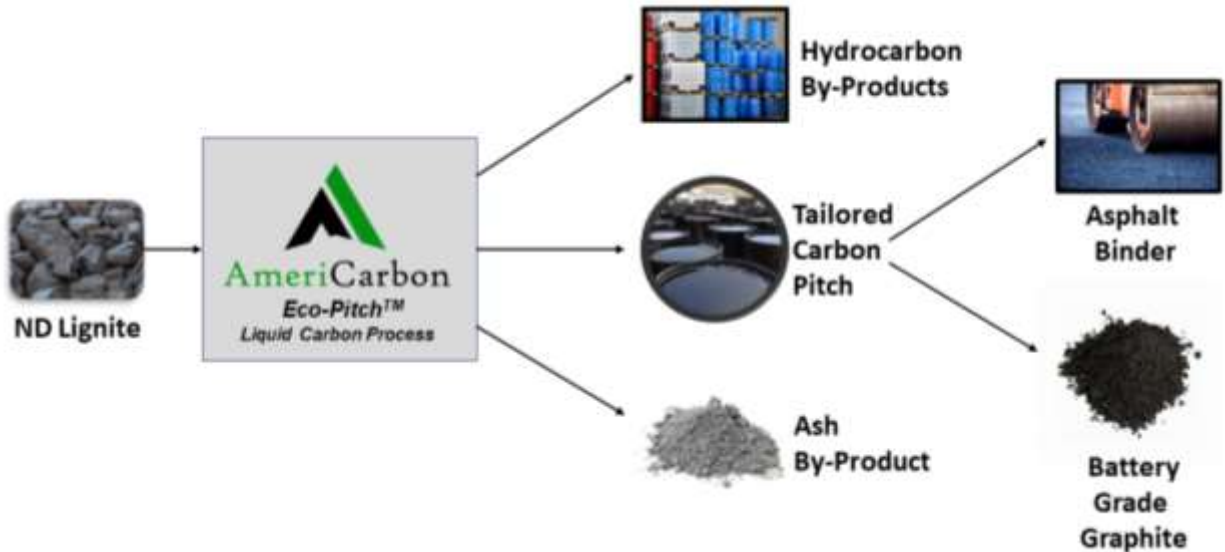


Figure 1. Simplified overview of AmeriCarbon’s Liquid Carbon Process.

Comprising more than a dozen unit operations, AmeriCarbon’s Liquid Carbon Process employs predominantly off-the-shelf, proven technologies. This approach leverages existing, proven methodologies to ensure operational efficiency, scalability, and cost-effectiveness. Having completed our third stage of engineering design (FEL2), AmeriCarbon has identified the conversion reactor as a critical area for enhancement to optimize the efficiency and cost effectiveness of the overall process. **This project is to optimize the commercial reactor design of the Liquid Carbon Process that will be used in the McLean Plant.**

The project will entail the following tasks (further detailed in the Project Description section):



- TASK 1: Analysis of AmeriCarbon Concept/Prototype Reactor Design
- TASK 2: Identify/Develop Reactor Preliminary Design Specifications
- TASK 3: Engineering Analysis and Prototype Design
- TASK 4: Fabricate, Install and Commission Prototype Reactor
- TASK 5: Generate Lignite-Based Pitch Material with Prototype Reactor

Based on work performed to date, AmeriCarbon has developed a preliminary design for the conversion reactor. To complete the project, AmeriCarbon will contract with Worley Parsons, a global engineering, procurement, and construction (EPC) company specializing in providing innovative solutions for complex projects across various industries, including energy, resources, and infrastructure. After creating the modified reactor, a range of lignite coal-derived pitches will be made in AmeriCarbon's pilot manufacturing facility using the prototype reactor to validate its efficacy. These pitch samples will be distributed to prospective customers and collaborators for feedback and evaluation.

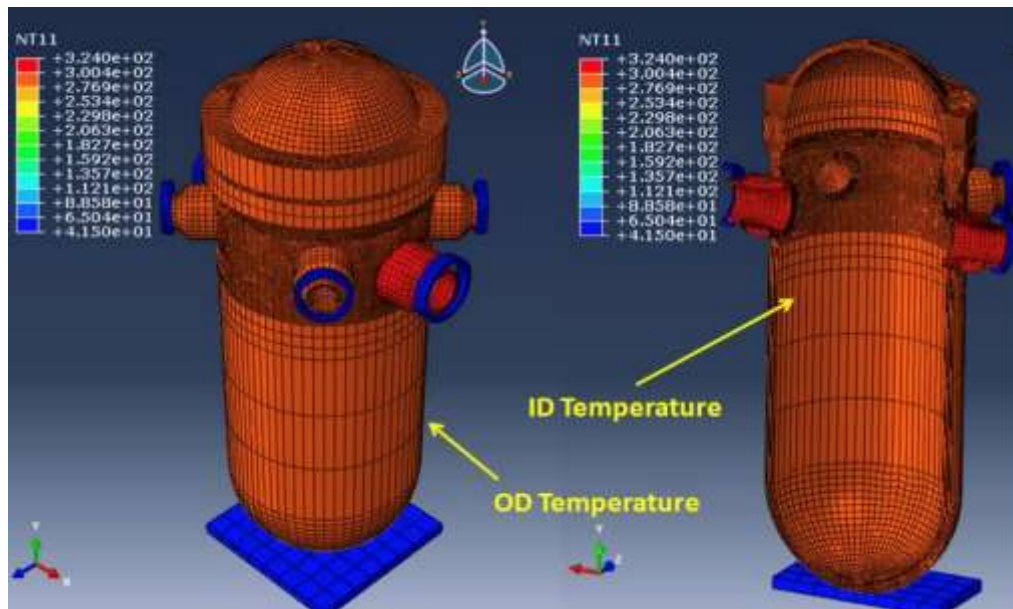


Figure 2. Hypothetical reactor illustration (stock image only).

Optimization of the reactor is imperative for integrating lignite processing seamlessly into AmeriCarbon's base module design. Lignite presents unique coal conversion differences, such as extensive volatile gas formation relative to other coal types, which must be addressed to harness the distinctive



beneficial carbon structures inherent in lignite. By optimizing the reactor, AmeriCarbon can overcome these challenges and ensure the efficient utilization of lignite in its processes. This project will not only enhance operational efficiency but will facilitate the seamless integration of the lignite conversion reactor into AmeriCarbon's base module design.

The overall objectives of this project are as follows:

1. Optimizing the commercial engineering design and scale-up of AmeriCarbon's Liquid Carbon Process to manufacture Eco-Pitch™, utilizing an optimized reactor configuration tailored for lignite coals.
2. Incorporating insights from previous NDIC-supported efforts to successfully convert lignite coal into specialty pitches, asphalt, and graphite into the improved design of the optimized reactor.
3. Validating the innovative reactor design and generating a variety of lignite-based pitches to expand the market base for North Dakota lignite coal.
4. Strengthening the domestic production capabilities of critical carbon materials, reducing reliance on foreign sources, and enhancing economic and defense security in the United States.
5. Enhancing customer feedback mechanisms and market viability for Eco-Pitch™ and other lignite-based products, fostering economic growth and job creation in North Dakota's lignite industry.

In summary, the project aims to optimize the commercial reactor design of AmeriCarbon's Liquid Carbon Process, enhancing domestic production capabilities, strengthening economic security, and expanding the market for North Dakota lignite coal.

3. Project Description

Project Objectives

As stated in the Project Summary section, the overall objectives of this project are the following:

1. Optimizing the commercial engineering design and scale-up of AmeriCarbon's Liquid Carbon Process to manufacture Eco-Pitch™, utilizing an optimized reactor configuration tailored for lignite coals.
2. Incorporating insights from previous NDIC-supported efforts to successfully convert lignite coal into specialty pitches, asphalt, and graphite into the improved design of the optimized reactor.



3. Validating the innovative reactor design and generating a variety of lignite-based pitches to expand the market base for North Dakota lignite coal.
4. Strengthening the domestic production capabilities of critical carbon materials, reducing reliance on foreign sources, and enhancing economic and defense security in the United States.
5. Enhancing customer feedback mechanisms and market viability for Eco-Pitch™ and other lignite-based products, fostering economic growth and job creation in North Dakota's lignite industry.

Critical Need / Technological and Economic Impacts

The optimization of the reactor is vital for seamlessly integrating lignite processing into AmeriCarbon's base module design. Lignite's material properties pose distinctive challenges, notably the significant volatile gas formation/evolution, necessitating solutions to harness lignite's unique structures effectively. By optimizing the reactor for lignite conversion, AmeriCarbon's Liquid Carbon Process can overcome these obstacles to unlock the unique material properties of lignite, ensuring the efficient utilization of lignite in the carbon materials supply chain. This project will not only bolster operational efficiency of the reactor itself, but also streamline the integration of the lignite conversion reactor into AmeriCarbon's base module design, contributing to a cohesive and efficient manufacturing process.

More broadly, AmeriCarbon's efforts to onshore the production of critical carbon materials such as coal tar pitch and graphite carries significant national security and geopolitical implications. These materials serve as essential components in various industries critical to national defense, infrastructure, energy storage, and transportation. Currently, the United States heavily relies on imports, particularly from China, for these materials, leaving its supply chains vulnerable to global tensions and disruptions. By establishing domestic production capabilities for coal tar pitch and graphite, AmeriCarbon is not only contributing to the nation's economic resilience but also helping to reduce its dependence on foreign sources for strategic materials. This strategic shift towards onshoring production aligns with broader efforts to bolster national security by securing essential supply chains and ensuring a reliable and uninterrupted supply of critical carbon materials essential for defense and industrial applications. By mitigating supply chain risks and



strengthening domestic manufacturing capacity, AmeriCarbon's commercial efforts (including the planned McLean Plant) help to safeguard the nation's security interests and promote economic sovereignty.

Current Industrial Reliance on Coking Ovens

The supply chain for coal tar pitch is characterized by its critical dependence on coal tar, a by-product derived from the coking process in steel manufacturing blast furnaces, constituting a by-product that is approximately 5% of the total output. However, the dominance of steel production by China, Russia, and other Asian countries underscores the vulnerability of the global coal tar pitch supply chain. In the United States, the steel industry experienced a significant decline in the 1970s and 1980s, resulting in a steep reduction in domestic capacity. Moreover, with the majority of U.S. steel production now reliant on recycled materials rather than coking ovens, the availability of domestic coal tar has dwindled to near-negligible levels, further exacerbating the challenge of sourcing coal tar pitch domestically.

Figure 3 shows China's dominance in steel manufacturing, which (prior to the scaling of AmeriCarbon's alternative approach) translates to China's dominance in the supply chain for advanced carbon materials.

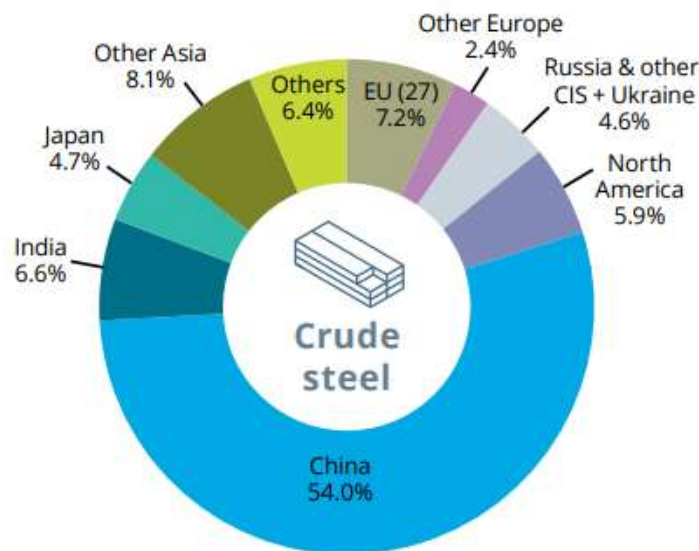


Figure 3. China dominates world crude steel production, leading to dominance in carbon supply chains. (Source: 2023 World Steel in Figures, World Steel Association, 18 May 2023)



The dynamic gets worse, however, for U.S. carbon supply chains. The blast furnace manufacturing method, utilizing coking ovens, is the process that produces coal tar as a by-product, unlike other methods which do not yield coal tar. Projections indicate a notable decrease in the utilization of the blast furnace method in the future (due to environmental concerns, among other things), further tightening the supply of coal tar. Meanwhile, the Electric Arc Furnace method – one of the primary alternatives to the blast furnace method of steelmaking – actually consumes substantial volumes of coal tar pitch (instead of producing coal tar as a by-product), exacerbating the increasing supply and demand imbalance for coal tar and coal tar pitch.

The looming supply / demand crisis in coal tar pitch was the primary driver in AmeriCarbon's entry into the market. We have targeted a manufacturing capacity of approximately 30,000 tons per year (measured in coal feedstock) for our base pitch manufacturing module, which represents an approximate 10x scaleup of our pilot manufacturing facility (described elsewhere herein). According to our research,¹ AmeriCarbon could construct approximately 20 to 25 base modules of the size planned for the McLean Plant over the next few years, just to keep up with the incremental growth in demand compared to a projected flat supply.² By 2029, this shortfall is estimated to be 500,000 tons in North America alone, which would require approximately 35 AmeriCarbon modules to match the incremental growth in demand (Figure 4). The estimated global shortfall is 4.5 million tons by 2029, based on management estimates using data from Market Insights and Benchmark Week 2022.

¹ Management estimates using data from Market Insights and Benchmark Week 2022

² Our assumption for flat supply does not factor in the projected decline in use of blast furnace method, likely underestimating the shortfall for coal tar pitch supply, nor the prospect that China and other producers of coal tar will consume their coal tar pitch to make higher value products.



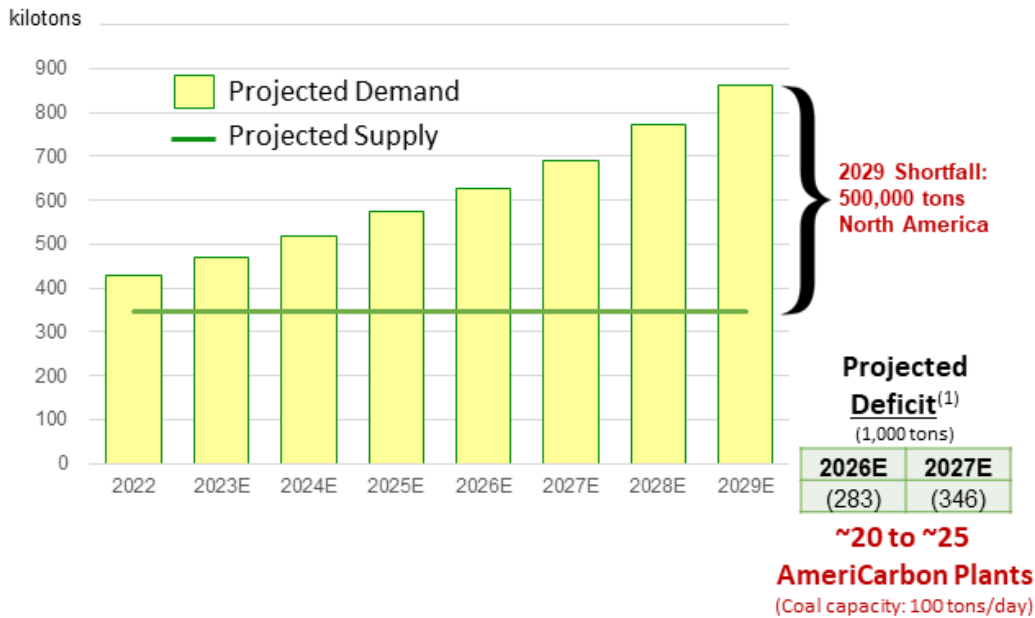


Figure 4. The United States has begun facing a major supply shortage for coal tar pitch.

With rapidly growing demand for advanced carbon products and dwindling supply, what are the solutions? Additional coking ovens will not be constructed to produce a ~5% by-product. One idea would be to replace a small subset of applications that currently require coal tar pitch and seek to use petroleum-based pitch as a replacement. This may work in certain instances, but petroleum pitch supply does not come in abundance, and has its own set of environmental concerns and unfavorable domestic supply / demand curve dynamics.

The other consideration – which is the one AmeriCarbon has been pursuing since 2020 – is the development of an alternative chemical pathway to produce coal tar pitch. However, to do so requires a pilot manufacturing facility that would cost ~\$20 million to design and construct, and require several years to design, build, and learn how to operate. This puts AmeriCarbon and its collaborators – and the McLean Plant – in pole position to help our nation address these concerning supply chain dependencies. The currently proposed project is on the critical path to entering the coal tar pitch market as a scalable solution.



Project Methodology / Statement of Work

The project methodology outlines a comprehensive approach to optimize AmeriCarbon's reactor design for lignite coal processing, comprising a series of tasks executed in collaboration with Worley. These tasks encompass a thorough analysis of the existing reactor design, identification of operational parameters, engineering analysis, prototype design, fabrication, installation, and commissioning. The ultimate goal is to generate lignite-based pitch materials with enhanced performance characteristics, validating the effectiveness of the optimized reactor design and advancing AmeriCarbon's mission of onshoring critical carbon material production.

TASK 1: Analysis of AmeriCarbon Concept/Prototype Reactor Design – A thorough concept design review and analysis of the AmeriCarbon reactor will be conducted to evaluate both process and mechanical constraints for optimization of lignite coal processing. This will include, but not be limited to:

- Operating pressures / temperatures
- Process operability requirements
- Heat transfer and flow requirements / limitations of design
- Materials of construction (MOC) requirements
- Fabrication complexities / requirements

The output from this task will inform activities in Task 2. *(Performers: AmeriCarbon/Worley)*

TASK 2: Identify/Develop Reactor Preliminary Design Specifications – Operational parameters will be identified and factored into preliminary design specifications for the optimized reactor. Targeted experimental reaction studies utilizing lignite coal will be conducted at AmeriCarbon's pilot manufacturing facility to inform necessary specification details. The design and throughput of the prototype reactor to be built and demonstrated will be based on the current AmeriCarbon pilot facility and concomitant integration into the Liquid Carbon Process. *(Performers: AmeriCarbon/Worley)*



TASK 3: Engineering Analysis and Prototype Design – Analysis of the new AmeriCarbon reactor will be conducted that may include, but not be limited to: flow studies, heat and mass transfer, structural, thermal stress, etc. These analyses will establish the initial design basis that will result in development of fabrication drawings, including all test/certification requirements for its construction. *(Performers: AmeriCarbon/Worley)*

TASK 4: Fabricate, Install and Commission Prototype Reactor – Per the design and fabrication drawings developed in Task 3, the prototype reactor will be fabricated and installed in the AmeriCarbon pilot facility. A number of testing procedures will be conducted to commission the reactor for safe pilot operations and verify effective operability range. *(Performers: AmeriCarbon/Worley)*

TASK 5: Generate Lignite-Based Pitch Material with Prototype Reactor – A variety of pitches made from lignite coal will be processed with the new prototype reactor to further validate its performance. Further, these pitch materials will be sent to existing AmeriCarbon customers/collaborators for feedback and continuous customer development such as the University of North Dakota, defense contractors, and carbon materials manufacturers. *(Performer: AmeriCarbon)*

Anticipated Results

AmeriCarbon seeks the following results from the proposed project:

- **Optimized Reactor Design.** Through thorough analysis and engineering efforts, AmeriCarbon anticipates achieving an optimized reactor design tailored in a manner to enable the optimal processing of lignite coal. This optimized design will address unique challenges such as the formation of gas pockets due to volatiles, ensuring efficient utilization of lignite while maximizing operational efficiency.
- **Enhanced Process Performance.** The implementation of the optimized reactor design is expected to result in enhanced process performance, including improved heat transfer, flow dynamics, and materials of construction (MOC) compatibility. This enhancement will enable AmeriCarbon to



overcome existing process limitations and leverage the unique structures present in lignite for the production of tailored and advanced carbon materials.

- **Streamlined Integration.** By dovetailing the lignite reactor into the base module design, AmeriCarbon aims to streamline integration efforts and improve uniform operation with its existing manufacturing processes. This integration will facilitate a more efficient production workflow and minimize downtime associated with reactor modifications or retrofits.
- **Market Expansion and Customer Satisfaction.** The successful optimization of the reactor design will enable AmeriCarbon to expand its market base for lignite-derived products, including Eco-Pitch™ and other carbon materials. By generating lignite-based pitches with improved performance characteristics, AmeriCarbon anticipates attracting new customers and collaborators while satisfying the needs of existing partners, including defense contractors, carbon materials manufacturers, and academic institutions.
- **Economic and Environmental Benefits.** AmeriCarbon expects the optimized reactor design to yield significant economic benefits by reducing production costs, enhancing product quality, and increasing overall competitiveness in the carbon materials market. Additionally, by utilizing lignite, an abundant and domestically sourced resource, AmeriCarbon aims to contribute to regional economic development while minimizing environmental impact through sustainable resource utilization practices.
- **Advancement Toward Commercialization.** The successful optimization of the reactor design represents a crucial milestone in AmeriCarbon's progress toward the commercial development and finance of the McLean Plant. By demonstrating the feasibility and efficacy of its technology at scale, AmeriCarbon will be better positioned to attract private investment, secure partnerships, and advance toward the realization of a commercially viable lignite processing facility.

Overall, AmeriCarbon anticipates that the optimization of the reactor design will not only strengthen its position as a leader in carbon materials innovation but also enable additional beneficial use cases for lignite.



Facilities & Equipment

The project will be conducted at existing facilities that are operated by the project's performers. The facilities are outlined below.

AmeriCarbon Research and Pilot Demonstration Facility



Figure 5: AmeriCarbon's Research and Pilot Demonstration Facility in Morgantown, West Virginia.

AmeriCarbon operates a state-of-the-art 12,000 sq-ft facility in the Morgantown Industrial Park (Morgantown, West Virginia) that contains infrastructure for laboratory through pilot-scale R&D. The facility contains six commercial flame suppression laboratory hoods and a wet chemistry area along with multiple high-bay areas for pilot-level research and demonstration.



Figure 6: AmeriCarbon's pilot scale unit operations that underpin the LCP process.



AmeriCarbon Equipment



Figure 7: AmeriCarbon's pilot scale and research equipment.

AmeriCarbon's equipment includes: coal liquefaction & coker trains capable of processing 10 tons per day; capable of producing custom coal pitch, needle coke, and advanced carbon products; product separation and collection train; both trains are fully automated and managed by an industry standard computer / software system; six commercial hood laboratory with flame suppression and exhaust system; fully equipped for benchtop lab research and development. The facility is heavily instrumented and managed by a PLC control system with continuous monitoring.

Environmental and Economic Impacts of the Project

With respect to the conduct of the proposed project, environmental impact will be minimal. Existing facilities will be used. The facilities used in the project will operate within reasonable parameters of waste and energy consumption that are consistent with their current usage levels.

In terms of immediate economic impact, the project budget of \$1,488,809, which includes cost share of \$745,000, includes \$280,000 to Worley Parsons and its contractors. Success of the project will contribute to the establishment of the McLean Plant, projected to result in several tens of millions of dollars of investment and the creation of 40-70+ long term jobs.

Future environmental impacts are also significant. *Eco-Pitch™* is a quantum leap forward in terms of improved environmental impact compared to current supplies. Due to AmeriCarbon's efficient and non-



combustible low temperature process, greenhouse gas emissions are reduced by more than 92% compared to coal tar pitch produced as a by-product of coking ovens in the steelmaking process (Downstream Strategies, 2021 and 2023). Further, because AmeriCarbon's process operates at lower temperatures, certain carcinogenic compounds and other harmful chemicals are not generated in the process.

4. Standards of Success

The project aims to bolster the domestic production of advanced carbon products, a strategic sector in the United States poised for substantial growth. Leveraging lignite coal as a primary raw material, AmeriCarbon and its collaborators seek to onshore the supply chain for advanced carbon material applications, enabling the creation of valuable finished products while dramatically reducing greenhouse gas emissions compared to existing industrial processes.

This project and the McLean Plant will play a pivotal role in establishing the foundation for the emergence of commercial-scale manufacturing facilities in North Dakota, aimed at seizing the economic potential presented by the onshoring of advanced carbon product production. Serving as a cornerstone, the production of carbon pitch from lignite coal will unlock additional manufacturing prospects, where lignite-derived carbon pitch serves as the basis for further refinement into high-value carbon materials and products. Over time, this endeavor has the potential to attract substantial capital investment, generate thousands of sustainable jobs, and contribute to the reduction of greenhouse gas emissions within the U.S. manufacturing sector.

The long-term success of this project, therefore, will be measured by the following:

1. *Commercial pitch production facilities.* How many commercial scale pitch production facilities will be located in North Dakota and in what time frame? Our hope, pending successful technical results, would be to enable at least one commercial facility located in North Dakota by 2026 with an installed capacity of 28,500 tons of production annually (including all products and by-products).
2. *Downstream manufacturing facilities.* How many additional advanced carbon products manufacturing facilities will be located in North Dakota that use carbon pitch as a feedstock, and what will be their economic impact? Our hope is that by 2030, there could be a network of manufacturers locating in North Dakota, leading to hundreds of jobs during construction and facility operations.



In order to evaluate the success of the proposed project, specific criteria need to be met:

- **Technical Milestones.** The project aims to achieve several technical milestones crucial for optimizing AmeriCarbon's reactor design and integrating it into the base module. These milestones include conducting a detailed concept design review and analysis of the AmeriCarbon reactor to evaluate process and mechanical constraints, identifying and developing preliminary design specifications for the optimized reactor, conducting engineering analysis and prototype design to establish the initial design basis, fabricating, installing, and commissioning the prototype reactor, and generating lignite-based pitch materials with the prototype reactor to validate its performance and gather feedback from stakeholders.
- **Operational Efficiency.** A key measure of success will be the operational efficiency achieved through the optimized reactor design. This involves maximizing throughput while minimizing energy consumption, waste generation, and overall production costs. The project will strive to achieve a significant improvement in process efficiency, ensuring that the reactor operates reliably and consistently at optimal performance levels.

By meeting these standards of success, the project will not only advance the domestic production of advanced carbon products but also contribute to job creation, economic growth, and environmental sustainability in North Dakota and beyond.

5. Background

Existing AmeriCarbon Facility and Background

The roots of AmeriCarbon's proprietary and patented Liquid Carbon Process date back to 2009, when a predecessor organization built a pilot-scale unit for broad coal liquefaction applications. AmeriCarbon re-engineered the facility to create the Liquid Carbon Process for intentional production of



tailored isophase and mesophase coal pitch intermediates and needle cokes. AmeriCarbon has produced pitch from lignite, bituminous and sub-bituminous coals and has also produced needle coke in the facility.

AmeriCarbon has the only known pilot-scale, coal liquefaction-based, pitch production facility in the world. The facility, detailed in the Project Description section, is a 12,000 sq-ft facility that contains infrastructure for laboratory through pilot-scale research and development. This allows for immediate and directly scalable engineering data from applied research generated to be confidently translated to a commercial scale plant. In our discussions with prospective customers, nearly all have expressed concerns about a lack of supply availability and desire to secure a domestic source of economical coal-derived pitch/chemical intermediate.

The Initial NDIC Project: Technical and Economic Feasibility Assessment

From January 2022 through June 2023, AmeriCarbon executed a project titled ***North Dakota Lignite Coal-Based Pitch for Production of High Value Carbon Products via AmeriCarbon Liquid Carbon Pitch (LCP) Process***, which was funded in part by NDIC. At the onset of that project, AmeriCarbon and its collaborators had technical theories and reason to believe that it would be technically feasible to convert North Dakota lignite coal into a coal tar pitch product. Implementation of the project has yielded the following results:

- ✓ Identified and quantified specific market applications
- ✓ Gained an understanding of desired product specifications
- ✓ Conducted chemical formulation and process evaluation studies
- ✓ Produced carbon products from lignite coal that have been tested and confirmed to meet market and customer specifications
- ✓ Evaluated by-products that contribute to the commercial viability of the liquid carbon process
- ✓ Developed a technoeconomic model that meets investor return thresholds

Under the initial project, AmeriCarbon and its project collaborators demonstrated that the production of carbon pitch from North Dakota lignite coal is technically feasible for multiple applications.

Engineering Design of AmeriCarbon LCP Base Module

In October 2022, AmeriCarbon engaged an engineering design contractor to develop an engineering design for the AmeriCarbon LCP process, focused on the production of *Eco-Pitch™*, hydrocarbon by-



products, and ash by-product. Under that ongoing effort, which has been funded to date exclusively by AmeriCarbon, preliminary engineering designs have been developed for AmeriCarbon's base module to produce Eco-Pitch™ from coal; the effort includes establishing cost estimates for equipment and other capital expenses required for construction and operation of the base module to produce *Eco-Pitch™* and its referenced by-products. The work product from this effort will achieve one of the key critical requisites for developing a commercial scale facility such as the McLean Plant. AmeriCarbon recently completed its third phase of engineering design (FEL2), which was completed by Worley Parsons.

Engineering Design of Asphalt and Graphite Modules

In 2023, NDIC contributed funding support to a second project with AmeriCarbon, titled ***Engineering Design and Feasibility Analysis for Commercial Graphite and Asphalt Manufacturing from Lignite-Derived Carbon Pitch***, to initiate engineering design and validate economic viability for the asphalt and battery modules of the McLean Plant. This second project builds on the prior effort funded by the NDIC in January 2022, which identified and demonstrated the technical potential of asphalt and battery grade graphite derived from lignite coal utilizing AmeriCarbon's patented/proprietary LCP process. The following are expected project results and deliverables:

- Front End Loading Engineering (FEL 1) to provide opportunity assessment and design basis for a commercial plant in North Dakota;
- Experimental process development studies to provide basis for the engineering design/study, technology readiness and the supply of product samples for customer assessment; and
- Technoeconomic evaluation study to verify business case for commercial plant.

The project currently being proposed builds on the prior work funded in part by NDIC, further improving the technical and economic viability of the conversion of lignite coal to coal tar pitch, thereby accelerating the development and finance of the planned McLean Plant, a commercial scale pitch manufacturing facility planned in North Dakota.



Prior Background

The basis for AmeriCarbon's Liquid Carbon Process was derived from long-standing coal liquefaction technology. Coal liquefaction was first successfully developed and implemented in Germany around the time of World War I because of abundance of coal reserves and the need to find alternative resources to petroleum-based transportation fuel for military vehicles like tanks, airplanes and warships. Friedrich Bergius, a German chemist, was the first to invent direct coal liquefaction to convert lignite to fuel in 1913 ^[22]. Bergius developed a process that required high pressure (70 MPa) and temperature (> 500°C) using iron-based catalyst. The indirect coal liquefaction process was later developed in 1923, famously known as Fischer-Tropsch process. In this process, the coal is first converted into "synthesis gas" (syngas) which is mainly a mixture of H₂ and CO, which is then converted into light hydrocarbon liquid fuel through a series of steps. Both these methods, direct and indirect coal liquefactions, were developed primarily to convert different types of coal into a fuel source^[23, 24]. The third method is pyrolysis in which coal is converted partly into liquid hydrocarbon and remaining into gaseous hydrocarbon and coke. This liquid hydrocarbon is commonly known as "coal tar", which served as a starting material for lot of chemical and material development^[25, 26]. After Germany, United States and Japan also embarked on all three different ways of coal liquefaction; direct, indirect and pyrolysis simultaneously. Unfortunately, the research exploration in this field started to cease as an enormous supply of petroleum was identified in Middle East in 1950. Currently, the only major liquefaction plants worldwide are operated by Sasol (syngas, indirect liquefaction) in South Africa and by Shenhua (direct liquefaction) in China^[27].

Until recently (driven by AmeriCarbon's efforts to adapt the process for pitch production), there has not been a critical demand to pursue coal liquefaction technology in the United States. However, recent efforts both in the United States and globally to exploit the superior properties of advanced carbon materials have prompted AmeriCarbon to leverage prior liquefaction efforts with its own innovations to produce the key intermediate chemical linking carbon-rich coal to manufactured carbon products...coal tar pitch. In the past, the United States had significant coking ovens for steel making that also produced coal tar pitch as a



by-product. This was sufficient at the time, but two things have since changed that caused a shortage in U.S. coal-tar pitch supply:

- US-based coke ovens have largely closed due to loss of the US steel industry and environment challenges with the coke ovens;
- Rapid and projected exponential growth of the carbon-based materials industry

AmeriCarbon is on an aggressive path to commercialize this technology and is currently focused on completing research/development and optimizing the process to allow intentional pitch plants to be scaled for specific coals.

Please refer to the Project Summary section for additional background regarding the project and the associated technologies.

6. Qualifications

AmeriCarbon Team Members

AmeriCarbon has assembled a credentialed project team and has developed a portfolio of strategic alliances with innovative developers, research institutions, and industry partners. Its executives bring expertise in the technical subject matter of hydrocarbon conversion, advanced coal products, technology scaleup and commercialization, and business and project finance.

Our team contributes the following to the proposed project:

- Technical Expertise. The AmeriCarbon team is led by **David Berry**, who is serving as principal investigator for the project. Dave has numerous patents and patents pending through more than three decades of institutional research experience with the U.S. Department of Energy and U.S. Department of Defense that are focused on hydrocarbon conversion technologies. Dave has extensive experience from the laboratory through the pilot-scale and has surrounded himself with world class researchers and innovative thinkers which have contributed to AmeriCarbon's unique technology. **Dr. Chetan Tambe** will serve as a senior researcher during the project. Dr. Tambe has a decade of experience in process design and development with a



- focus on hydrocarbon liquid processing. **Mark Scafella** will serve as senior chemical technician. Mr. Scafella constructed the AmeriCarbon LCP pilot facility and has 10 years operating experience in the facility conducting coal liquefaction to various fuels, chemicals and pitch.
- **Scale Up Capability.** AmeriCarbon's business executives have spent the majority of their decades-long careers working in the realm between laboratory scale research and industrial development. The skills required to commercialize technology through the pilot demonstration phase are invaluable and contribute to AmeriCarbon's special capabilities in technical innovation and application.
 - **Commercial Track Record.** Implementing innovation at pilot and industrial scale requires experience in large commercial transactions and the ability to manage capital with discipline. These qualities are the hallmark of AmeriCarbon's financial and commercial team members, who have raised and managed several hundred million dollars in the energy and materials sectors. **Greg Henthorn** formally serves as AmeriCarbon's vice president of business development and will continue to lead these activities in addition to providing project management and business operations support for the project. **Chad Green** is the company's CFO and has been involved in several billion dollars in commercial finance, including private equity and public markets.

Worley Parsons Team Members

Art Lucas has built a record of engineering accomplishments within various engineering disciplines, with experience at MATRIC, Marathon Ashland Petroleum, Akzo Nobel, Sunoco Chemicals, and DuPont Chemicals. He has provided engineering support for propylene purification and polymerization, polymer extrusion technology, process debottlenecking, solid handling and material transfer operations. He also has experience in simulating chemical processes with engineering software to develop a complete understanding of system dynamics. Art has been heavily involved in the design and detailed engineering for a biodiesel plant based on novel continuous technology. Art has a BS in Chemical Engineering from West Virginia University Institute of Technology.



Note: Detailed resumes from AmeriCarbon and Worley Parsons are included in Appendix 7-1.

7. Value to North Dakota

The proposed project will contribute to onshoring the supply chain of advanced carbon products – with current feedstock demand being largely met by China – and connect the dots all the way from raw materials (in the form of lignite coal) all the way to a finished product, reducing our nation’s reliance on foreign suppliers to fuel growth in this strategic area. This economic activity can leverage North Dakota’s rich and abundant supply of lignite by using it as a highly valuable raw material feedstock for value-added manufacturing.

The proposed project plays a necessary and critical role in the development of the McLean Plant. Upon breaking ground, the McLean Plant will have immediate, near term, and long-term impacts with respect to the creation of high wage employment for McLean County, North Dakota and the surrounding region. The facility is projected to create 40 high wage full time jobs when the facility opens, with growth to 70 jobs at full capacity. The created jobs will be manufacturing and engineering jobs with high wages and located in and near economically distressed regions. The company has entered into a Memorandum of Understanding regarding a Project Labor Agreement regarding the McLean Plant. AmeriCarbon is committed to workforce development as a major pillar of the company’s activities in North Dakota.

The proposed project will enhance the use of North Dakota lignite coal by providing an alternative commercial use other than electricity. In the event that coal-fired electricity generation remains steady over time, this project could also lead to an opportunity to grow the coal industry and provide funds for increased research, jobs, and economic growth and development.

Products of the McLean Plant can be used to create electric vehicles parts and electrodes as well as to keep up with the growing demand for charging stations around the state. It can also lead to additional asphalt production that could extend beyond the state’s borders. The McLean Plant will help to preserve existing coal jobs by ensuring demand for the product in case of an economic downturn in the coal industry.

The proposed project will also lead to job growth in the coal sector due to the additional demand for lignite



coal to be used for carbon pitch. Demand for advanced carbon products is growing annually and when combined with the AmeriCarbon LCP process, the underlying opportunity is to convert lignite coal into valuable products worth several thousand dollars per ton. Job growth can also come from the resurgence of domestic production of carbon pitch in the United States.

8. Management

From an organization/company point of view, AmeriCarbon will serve as the point organization and will manage the project, including all vendors and personnel who are performers under the project. From an individual perspective, David Berry will be the Principal Investigator and lead the project team.

The project will have a flat organizational structure reporting to a single authority, the Principal Investigator. This is intended to streamline project communication and decision making, facilitating the performance of the tasks and achievement of the objectives described in the proposal, including in the Methodology section in a timely and efficient manner, and in the timeframe outlined in the proposal.

The project team's flat organizational structure will allow for efficient and rapid response to questions and challenges that may arise in the performance of the project. Communication will occur largely via videoconferences and telephonic conferences on regularly scheduled and ad hoc bases throughout the project as needed. The principal investigator has considerable experience in managing teams in different locations, managing project scope, and ensuring technical direction without veering off track. This will provide a disciplined approach to project timelines and budgeting while avoiding scope creep challenges. The principal investigator will be responsive to incoming requests from NDIC and is prepared to schedule videoconferences, telephonic meetings, or in-person meetings as desired.

As noted in the attached resumes, which may be found in Appendix 7-1, the principal investigator has more than three decades of research experience, including the management of cross functional teams



with diverse skills and competencies. All members of the team have considerable experience managing and performing in similar teams spanning multiple decades.

Risk Management Plan

AmeriCarbon continually identifies risks and challenges to the project, including financial, technical, performance, schedule, and regulatory compliance. Strategies for mitigating and managing these risks include developing contingency plans, conducting risk assessments, and implementing quality assurance and quality control measures. Regular communication and collaboration with stakeholders and team members is essential to keep everyone informed of progress and address any issues or concerns.

The following risks and contingencies have been identified for consideration with respect to the scope of work of the proposed project:

1. Technical Complexity and Uncertainty:

- Risk: The project involves complex technical processes such as reactor design, engineering analysis, and prototype fabrication, leading to uncertainties in outcomes.
- Mitigation: Conduct thorough research and feasibility studies before initiating each task. Engage subject matter experts and leverage advanced simulation tools to predict potential challenges and optimize design parameters. Implement agile project management methodologies to adapt to changing requirements and mitigate technical risks incrementally.

2. Operational Challenges:

- Risk: Operating pressures, temperatures, and flow requirements may pose challenges in achieving desired process performance and operability.
- Mitigation: Implement rigorous testing protocols during the fabrication and commissioning of the prototype reactor to validate its operational capabilities. Conduct comprehensive training for operators and maintenance personnel to ensure efficient operation and troubleshooting of the reactor. Establish contingency plans to address potential operational disruptions and minimize downtime.

3. Materials Selection and Compatibility:



- Risk: Selection of suitable materials of construction (MOC) for the reactor may pose challenges due to compatibility issues with process conditions and materials handling requirements.

- Mitigation: Engage materials engineers and experts in corrosion science to assess MOC requirements and compatibility with the process environment. Conduct thorough testing and qualification of selected materials to ensure their suitability for long-term use in the reactor. Establish quality control measures to monitor material performance and address any issues proactively.

4. ***Supply Chain and Fabrication Risks:***

- Risk: Delays or disruptions in the supply chain for critical components and materials may impact the fabrication and installation schedule of the prototype reactor.

- Mitigation: Diversify the supply chain and establish alternate sourcing options for critical components to reduce dependency on single suppliers. Maintain open communication channels with suppliers to anticipate potential bottlenecks and address them proactively. Implement project scheduling and tracking tools to monitor progress and identify any deviations from the timeline early on.

5. ***Feedback and Collaboration Challenges:***

- Risk: Limited or inadequate feedback from customers and collaborators could hinder the validation and refinement of the prototype reactor's performance.

- Mitigation: Establish clear communication channels with customers and collaborators to facilitate timely feedback on pitch materials processed with the prototype reactor. Organize regular meetings, workshops, and surveys to gather input and insights from stakeholders. Foster a collaborative and transparent working environment to encourage active participation and engagement in the project.

9. Timetable

The proposed project is anticipated to take 18 months from project initiation. The following is a timeline Gantt chart with milestones, milestone table and suggested deliverables:



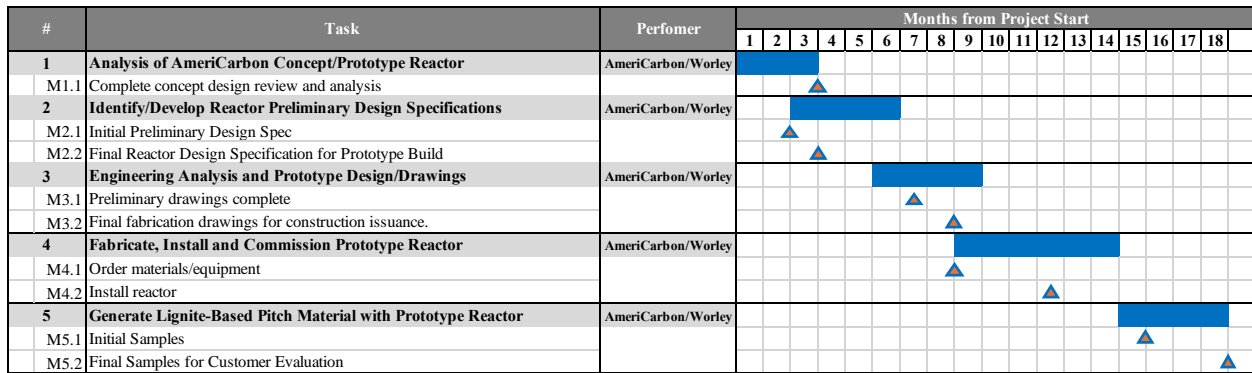


Figure 8. Project timetable.

The following are the deliverables and timeline:

#	Deliverables	Due Date
D1	Quarterly Reports	Per Quarter End
D2	Pitch Samples	Per Request
D3	Final Report Submission	End of contract

Figure 9. Table of project deliverables.

10. Budget

The project budget totals \$1,488,809, with \$743,809 being requested from NDIC, \$20,000 in in-kind services provided by NACoal, and \$725,000 provided as in-kind services from AmeriCarbon. A detailed budget was prepared using the standard U.S. Department of Energy budgeting model. Key tables from the budget are included in Appendix 11-1. Where the tables reference “Federal Share”, it is intended to indicate the proposed “NDIC Share”.

II. Matching Funds

Support letters for matching funds are included in Appendix 12-1, including a cost share commitment of \$20,000 from NACoal and \$725,000 from AmeriCarbon, for a total cost share resulting in a combined cost share of \$745,000, representing greater than 50% of the overall budget.



12. Tax Liability

The applicant does not have any past due tax liability with the State of North Dakota. An affidavit is attached in Appendix 13-1.

13. Confidential Information

Not applicable.

14. References

1. Markets, R., 2020. China Coal Tar Industry Report 2019-2025. [online] Available at: <https://www.globenewswire.com/newsrelease/2019/02/26/1742153/0/en/China-Coal-Tar-Industry-Report-2019-2025> > [Accessed 22 November 2020].
2. Baron, J.T., S.A. McKinney, and R.H. Wombles, "Coal Tar Pitch- Past, Present and Future", Light Metals, 2009.
3. Brooks, J.D. and G.H. Taylor, "The formation of graphitizing carbons from the liquid phase", Carbon, Vol. 3, 185-193, (1965)
4. Cheng, X., Li, G., Peng, Y., Song, S., Shi, X., Wu, J., ... & Hu, G. (2012). Obtaining needle coke from coal liquefaction residue. *Chemistry and Technology of Fuels and Oils*, 48(5), 349-355.
5. Craddock, J. D.; Rantell, T. D.; Hower, J. C.; Whitlow, D. T.; Wiseman, J.; Weisenberger, M. C. Anode coke from coal- a low cost approach. *Fuel* 2017, 187, 229–241
6. Dadyburjor, D., P.R. Biedler, C. Chen, L.M. Clendenin, M. Katakdaunde, E.B. Kennel, N.D. King, L. Magean, P.G. Stansberry, A.H. Stiller, and J.W. Zondlo, 2005, "Production of Carbon Products Using a Coal Extraction Process", Final Report, DEFC26-02NT41596.
7. Garcia, J.L. Crespo, S.C. Martin, C.E. Snape, S.R. Moinelo, "Development of Mesophase from a Low-Temperature Coal Tar Pitch", *Energy & Fuels* 2003, 17, 291-301
8. Halim, H. P., Im, J. S., & Lee, C. W. (2013). Preparation of needle coke from petroleum by-products. *Carbon letters*, 14(3), 152-161.
9. Kennel, E.B., C. Chen, D.B. Dadyburjor, M.S. Heavner, M. Katakdaunde, L. Magean, J.J. Mayberry, A.H. Stiller, J.M. Stoffa, C.L. Yurchick, and J.L. Zondlo, 2011, "Development of Continuous Solvent Extraction Processes for Coal Derived Carbon Products", Final Report, DE-FC26-03NT41873.



10. Korai, Y., I. Mochida, "Preparation and properties of carbonaceous mesophase-I soluble mesophase produced from A240 and coal tar pitch", *Carbon* Vol. 23, No. 1, 97-103, (1985)
11. Machnikowski, J, W Kaczmarek, A Leszczynska, P Rutkowski, M A Diez, R Alvarez, R Garcia, "Hydrogen transfer ability of extrographic fractions of coal tar pitch" *Fuel Processing Technology* 69 (2001) 107-126
12. Mochida, I, Y Korai, C H Ku, F Watanabe, Y Sakai, "Chemistry of synthesis, structure, preparation and application of aromatic-derived mesophase pitch" *Carbon* 38 (2000) 305-328.
13. Mochida, I, K. Shimizu, Y. Korai, H. Otsuka, Y. Sakai, S. Fujiyama, "Preparation of mesophase pitch from aromatic hydrocarbons by the aid of HFBF3, *Carbon* Vol. 28, No. 2-3, 311- 319, (1990)
14. Mochida, S., Fei, Y. Q., Oyama, T., Korai, Y., & Fujitsu, H. (1987). Carbonization of coal-tar pitch into lump needle coke in a tube bomb. *Journal of materials science*, 22(11), 3989-3994.
15. Owen, Aaron, David Eaton, Rodney Andrews and Matthew Weisenberger, "Assisted development of mesophase in pitch with the use of dispersed graphene", *CARBON 2018*, Madrid Spain, 1 – 6, July 2018
16. Predel H. Petroleum coke. In: Bohnet M, ed. *Ullmann's Encyclopedia of Industrial Chemistry*. 7th ed., Wiley-VCH, Weinheim, 361 (2012)
17. Ramjee, S.; Rand, B.; Focke, W. W. Low shear rheological behaviour of two-phase mesophase pitch. *Carbon* 2015,82, 368–380.
18. Tamashauskyy, Albert V. "An Introduction to Synthetic Graphite", *Asbury Carbon* (2006)
19. Yeware, Krunal, *Graphite Market by Type (Natural Graphite and Synthetic Graphite) and Application (Lubrication, Refractories, Foundry, Battery Production, and Others): Global Opportunity Analysis and Industry Forecast, 2019–2027* (2020).
20. Zhang, X., Ma, Z., Meng, Y., Xiao, M., Fan, B., Song, H., & Yin, Y. (2019). Effects of the addition of conductive graphene on the preparation of mesophase from refined coal tar pitch. *Journal of Analytical and Applied Pyrolysis*, 140, 274-280.
21. Zhu, Y., Liu, H., Xu, Y., Hu, C., Zhao, C., Cheng, J., ... & Zhao, X. (2020). Preparation and Characterization of Coal-Pitch-Based Needle Coke (Part III): The Effects of Quinoline Insoluble in Coal Tar Pitch. *Energy & Fuels*, 34(7), 8676-8684.
22. Industry, U.K.D.o.T.a., *Coal Liquefaction: Cleaner Coal Technology Program, Technology Status Report 010*. October 1999: U.K.
23. IEA Coal Research Ltd, U., et al., *Review of Worldwide Coal To Liquids R,D&D Activities And The Need For Further Initiatives Within Europe*. June 2019, IEZ, Clean Coal Center.
24. ICL, I.L., D.P.D. Designs, and F. Specifications, *Direct Liquefaction Presentation Outline*.



25. Miller, C.L. Coal conversion–pathway to alternate fuels. in US DOE Presentation, EIA Energy Outlook Modeling and Data Conference, Washington, DC. 2007.
26. Mochida, I., O. Okuma, and S.-H. Yoon, Chemicals from direct coal liquefaction. Chemical reviews, 2014. 114(3): p. 1637-1672.
27. Van Dyk, J., M. Keyser, and M. Coertzen, Syngas production from South African coal sources using Sasol–Lurgi gasifiers. International Journal of Coal Geology, 2006. 65(3-4): p. 243-253.

15. Appendices

Attached.



Appendix 6-1

DAVID A. BERRY

EDUCATION AND TRAINING

West Virginia University, Chemical Engineering, B.S. (1984)
West Virginia University, Chemical Engineering, M.S. (1999)

RESEARCH AND PROFESSIONAL EXPERIENCE

CEO/CTO – AmeriCarbon LLC, Morgantown, WV, 2020 – current:

Leading the commercialization of coal conversion to enabling carbon pitch intermediate for high-value carbon product manufacturing such as arc furnace carbon electrodes, advanced battery storage electrodes, carbon fibers, carbon foams, computer chips and other carbon-based products for commercial and defense sector. owns and operates a 12,000 ft² research/production facility with full laboratory facilities (vented hoods, wet chemistry, etc.) as well a continuous PLC controlled pilot scale hydrocarbon processing train for high temperature/high-pressure chemical conversion and other PLC controlled pilot space.

Associate Director – National Energy Technology Laboratory, Morgantown, WV, 2009 – 2020:

Managed a multi-million-dollar research program of engineers and scientists with primary expertise in catalysis, reaction engineering, surface science, electromagnetic energy, plasma chemistry, hydrocarbon conversion (coal, oil, NG) and materials science. Major focus in the development of fossil energy conversion technologies involving fuels/chemicals production, gas cleanup, power-generation cycles (turbines, fuel cells, hybrids), syngas conversion and hydrocarbon fuel reforming (i.e. diesel, logistic fuels, natural gas, coal-derived, bio-fuel...) including coal/biomass & methane gasification. Responsible for oversight of >36 laboratories ranging from bench-scale to small pilot operations.

Research Leader – National Energy Technology Laboratory, Morgantown, WV, 1992 – 2009:

Managed/conducted research for a \$10 Million per year, multi-disciplined research team (engineers, scientists, technicians) in the development of fuel processing technology involving projects ranging in size from \$200,000 – \$500,000 per year. Focus involved developing capability and technology for processing of hydrocarbon fuels (i.e. diesel, logistic fuels, natural gas, coal-derived, bio-fuel...) for integrated operation with fuel cell systems. Developed program for coal/biomass & methane gasification. Established new science capability development with plasma and electromagnetic frequency technologies. Construction & operations of multiple laboratories from laboratory through small pilot scale. Processes include test reactors (fixed, fluid, and transport), catalyst and sorbent preparation and an array of analytical characterization equipment/methods.

Technology Manager – National Energy Technology Laboratory, Morgantown, WV, 1986 – 1992:

Managed a \$10 million per year research and development program for the development of advanced high temperature solid oxide fuel cell power generation systems. Conducted all phases of planning (vision/objectives/requirements), budgeting, patents/license and functional management of multiple development projects with values ranging from \$200 k to \$150 M. Interfaced with academia, government (civilian & defense), industrial, and utility groups, both foreign and domestic, to accomplish and facilitate the development. Facilitated technology development and demonstration through coordinated cost participation between industrial participants, natural gas utilities and electrical power generation utilities.

Project Manager – Belvoir R&D Center, Fort Belvoir, VA, 1984 – 1986:

Managed and conducted engineering for development effort between various military groups and industrial companies (Allied Signal, Goodyear, OPW...) for a turbine-based helicopter and ground vehicle refueling system for use in extreme arctic conditions from development stage through conduct of end user/military acceptance testing and eventual acceptance into official army inventory.

PUBLICATIONS - Selected

1. Ping Wang, Bret Howard, Nicholas Means, Dushyant Shekhawat, David Berry. "Coal chemical-looping with oxygen uncoupled (CLOU) using a Cu-based oxygen carrier derived from natural minerals". *Energies* 2019, 12, 1453, doi:10.3390/en12081453.
2. Daniel J Haynes, Dushyant Shekhawat, David A Berry, Amitava Roy, James J. Spivey, Effect of calcination temperature on the steam reforming activity of Ni substituted pyrochlore catalysts, Jun 2018 to *Applied Catalysis: A: Gen.*
3. Ping Wang, Nicholas Means, Bret Howard, Dushyant Shekhawat, and David Berry, The Reactivity of CuO Oxygen Carrier and Coal in Chemical-Looping with Oxygen Uncoupled (CLOU) and In-situ Gasification Chemical-Looping Combustion (iG-CLC), *Fuel* 217 (2018) 642-649.
4. M.W. Smith, D.A. Berry, D. Shekhawat, D.J. Haynes, J.J. Spivey, Partial oxidation of liquid hydrocarbons in the presence of oxygen-conducting supports: Effect of catalyst layer deposition, *Fuel*, 89 (2010) 1193-1201.
5. D.J. Haynes, A. Campos, M.W. Smith, D.A. Berry, D. Shekhawat, J.J. Spivey, Reducing the deactivation of Ni-metal during the catalytic partial oxidation of a surrogate diesel fuel mixture, *Catal Today*, 154 (2010) 210-216.
6. D. Shekhawat, D. A. Berry, H. W. Pennline, E. Granite, J. J. Spivey, Special Issue: Advanced Fossil Energy Utilization, *Fuel*, Volume 89, Issue 6, January 1, 2010.
7. Maria D. Salazar-Villalpando, D. A. Berry and A. Cugini, Role of Lattice Oxygen in the Partial Oxidation of Methane over Rh/Supported Ceria Catalysts. *Isotopic Studies, Solid State Ionics*, December 2009.
8. M. Salazar, D. A. Berry and T. H. Gardner, "Partial Oxidation of Methane over Rh/Supported-Ceria Catalysts: Effect of Catalyst Reducibility and Redox Cycles", Published, *International Journal of Hydrogen Energy*, 33/11, (2008), 2695-2703
9. Shadle, L.J., Berry, D.A., and Syamlal, M., "Coal Gasification", *Encyclopedia of Chemical Technology, Concise, 5th Edition (ISBN 978-0-470-04748-4)*. , John Wiley & Sons, Inc., NY, NY, May 2007.
10. Turton, R.A., Berry, D.A., Gardner, T.G., and Miltz, A., "The Evaluation of Zinc Oxide Sorbents in a Pilot-Scale Reactor: Sulfidation Kinetics and Reactor Modeling", *Industrial Engineering and Chemistry, Ind. Eng. Chem. Res.* 2004, 43, 1235-1243

PATENTS - Selected

1. U.S. Patent # 9,935,318 SOFC Cathode with Oxygen Reducing Layer, (2018)
2. U.S. Patent 9,598,644 Method of CO and/or CO₂ hydrogenation to higher hydrocarbons using doped mixed metal oxides, (2017).
3. U. S. Patent 9,562,203 Methane-rich syngas production from hydrocarbon fuels using multi-functional catalyst/capture agent, (2017).
4. U.S. Patent 9,126,833 Process for continuous synthesis of mixed oxide powders, (2015).
5. U.S. Patent 8,486,301 Method for designing a reforming and/or combustion catalysts system, (2013).
6. U.S. Patent # 7,442,353 "Heat Recirculating Reformer for Fluid Stream Pollutant Removal, (2008).

SYNERGISTIC ACTIVITIES

- Editorial Board Member, "Catalysis Today", January 2006-2009.
- Distinguished Visiting Scientist, Oak Ridge National Laboratory, April 2002.
- Research Management Board Member, Army Core Technology Program (CTP) for Power Systems, June 2005 / 2006.

GREGORY G. HENTHORN

EDUCATION

West Virginia University, Morgantown, WV, Executive MBA (2003);

West Virginia University, Morgantown, WV, J.D. (2000)

West Virginia University, Morgantown, WV, B.S., Chemical Engineering (1995)

RESEARCH AND PROFESSIONAL EXPERIENCE

AmeriCarbon Products, LLC; VP of Corporate Development; Morgantown, WV; 2020-present;

Focuses on commercial transactions; investor relations, capital attraction and management; business development with customers and collaborators; administrative and financial oversight.

West Virginia University; Associate Professor (Adjunct); Morgantown, WV; 2019-present;

Energy Production and Operations (ENLM 220)

Flat Rock Energy; EVP of Business Development; Morgantown, WV; 2010-2020; Flat Rock is

a private equity funded oil and gas exploration and production company that develops, funds, and implements drilling programs in the Appalachian Basin. Founder of company, securing more than \$100 million in private equity funding; Negotiated commercial transactions with investors and other oil and gas operators.

Kinetic Clean Energy; Managing Partner; Morgantown, WV; 2007-2010; The company

coordinated the origination, development, and finance of several methane-based renewable energy projects. Financed more than \$50 million in renewable electric power facility construction projects; Organized facility to convert fleet vehicles to compressed natural gas; Assisted in the formation of a team to commercialize ethane-to-plastics technology.

Fourth Venture Group; Vice President; Morgantown, WV; 2000-2007; Fourth Venture was an

angel capital and early stage venture capital firm that served as a launching pad for technology commercialization and economic development. Served as Chief Operating Officer for a 500,000-

member online portal that integrated with hundreds of brick-and-mortar merchants; Worked with DOE laboratories and NGOs to commercialize technologies developed in former Soviet military research institutes; Explored development of a liquefaction facility to convert coal to liquid transportation fuels; Co-founded an enterprise-class business-to-business software company that was focused on the surveying and construction sectors, from establishment of the business to its divestiture; Held executive management positions in two specialized manufacturing companies.

SELECTED PUBLICATIONS & PRESENTATIONS

- “New Business Opportunities in TransTech Energy Technologies”, West Virginia Senate Economic Development Committee Meeting, West Virginia State Capitol, January 18, 2011.
- “Opportunities for the Coal Industry to Create Revenue from Carbon Offsets”, 36th Annual West Virginia Mining Symposium, West Virginia Coal Association, Civic Center, Charleston, WV, February 18, 2009.
- Bai, Xingji and Henthorn, Greg. “13 Per Day.” *Capacity Magazine* Spring (2007): 77-79. Print.

SYNERGISTIC ACTIVITIES

1. **TechConnectWV**, Charleston, WV; Member, Board of Directors, 2004-present; Member, Executive Committee, 2010-present. TechConnectWV is a non-profit, 501(c)(3) organization dedicated to the advancement of science, technology, and the innovation economy in West Virginia.
2. **West Virginia University**, under contract with Kinetic, 2012-2016; *Feasibilities of a Coal-Biomass to Liquids Plant in Southern West Virginia* (Award DE-FE0009997).
3. National Research Center for Coal & Energy, West Virginia University, Morgantown, WV; Consultant, Energy Efficiency Division, under contract with Kinetic, 2010-2011; *Supported establishment of initial TransTech Energy Conference*.
4. **West Virginia High Technology Consortium Foundation**, Fairmont, WV; Consultant, INNOVA Commercialization Group, 2010-2011; *Identification of technology commercialization and investment opportunities at NETL and WVU*



Art Lucas

Senior Principal Process Engineer

Summary

Mr. Lucas has more than twenty-two years of process design and research experience in the Chemical and Polymer industries. Responsibilities have included process engineer, research engineer and other roles.

Education

2000 B.S. Chemical Engineer, West Virginia Institute of Technology, Montgomery, WV

Experience

2023-Present Senior Principal Process Engineer, Worley, Charleston, WV

- Air Permitting & Emissions for Blue Ammonia Technology
- Proposal and Scope Work OSBL Blue Ammonia Technology
- Plastics Recycling Technology
- UniSim Modeling with OLI Software
- Worley Education Passports in Low Carbon Hydrogen, Ambition, Sustainability, Energy

2006-2023 Senior Research Engineer, MATRIC, South Charleston, WV

Technology development and deployment of various technologies at both laboratory and pilot scale as listed below.

- Batch polymerizations with novel technologies
- Liquid-Liquid Extractions
- Membrane technology and filtrations
- High Molecular weight polymerization
- Pyrolysis Technology
- Agitated filter drying and precipitations
- Adsorption Technologies
- Renewable Energy Technology
- Recycle Technology for various consumer products
- Chlorination reactions with shock sensitive byproducts
- Algae processing to make nutraceuticals

- Wiped Film evaporation and azeotropic distillations
- Slurry handling of both miscible and immiscible solutions.
- Solids handling of pseudoplastics and high viscosity polymers

Responsibilities included the following:

- Technical liaison with customers technical staff to develop scope of work, project execution plans and testing protocols.
- Developed all documentation for pilot scale operations. This included but not limited to, P&IDs, mass and energy balances, operating procedures, EHS, Safety assessments, emergency response and daily operational plans.
- Managed customer projects from concept to completing. A Dual role as Senior Research Engineer and Project Manager. Managed average capital expenditures of \$500K to as excess of \$1.5MM.
- Technical documentation for patent filing for successful technology for both the customer and internal research projects.
- Trained the operation workforce on the new technology deployments. This includes sample methodology as well as operation know how.
- Developed technology packages for renewable energies as part of the Renewable Fuel Standard.
- Worked with customer to mitigate risk for large scale fermentation to acid technology hurdles. Solutions were adopted and customer deployment commercial scale implementation in excess of \$300MM.
- Developed and patented technology in Pyrolysis and Reverse Osmosis Membranes.
- Lead engineer for design and implementation of patented continuous biodiesel facility. Overseen technology transfer, prepared design and bid packages and orchestrated project implantation in a cradle to grave role. This also included writing all Standard Operation procedures an defining the safety and compliance issues for the facility.

2006 – 2006 Process Engineer, DuPont Chemical Company, Belle, WV

- Debottlenecking process by redeveloping process conditions.

Solid Handling and Material Transfer

Vacuum Operations

Slurry Transfer

Batch Processing

Blending and Conveying

- Responsible for all activities surrounding production metrics of the unit.
- Provided 24hr coverage for area of unit responsibility to provide direction as require for all production problems.
- Organized a process workflow system that directed the human interfaces with the process for optimal performance.
- Educated/Trained operations on critical paths for success and very instrumental in fostering a higher standard ow work practices of operational employees.
- Developed and implemented new process guidelines and control limits.
- Responsible for operational instructions for evening and night shift employees.

2001 – 2005

Project/Process Engineer, Sunoco Chemical – Kenova, WV

Extrusion Process

- Implemented Rheology technologies for improved process control.
- Project engineer for de-bottlenecking extrusion line.

Capital \$1.75 MM

Designed and implemented Master Batch Additive System

- Rotating equipment

Twin Screw Extruders

Gear pumps

Blenders

Conveyors

Rotary valves

Pelletizers

Bulk material transfer

Gravity and pneumatic conveying systems

- Decreased off spec product by improving raw additive blend methods.
- Fully utilized new and existing PLC components for decreasing labor efforts along additive system.
- Orchestrated work efforts with hourly group to obtain new process workflow and procedure for new equipment.
- Preventative maintenance routines and monitoring for new equipment.
- Daily engineering support to production. Organized and developed “Best Practices” along extrusion line using root cause analysis.

300% increase in reliability

Increased first pass prime material from 93% to 98.2%.

Polymerization Process:

- Improved first stage reaction control by installing a refrigerated water/glycol system.
 - Twin screw and reciprocating compressor technology
- Operating Discipline Rollout member
- Spheripol Catalyst Technologies
- Provided engineering support to operations for high activity catalyst trials.
- Combined reaction kinetics and catalyst technologies to minimize byproduct formation.
- Decreased off-spec product by 50% by developing and implementing IMR models for online Rheology measurement.

Propylene Purification:

- Catalyst technologies for feedstock purifications
- Installed and commissioned first Nickel catalyst bed within Chemicals division (\$100K capital).

- Utilized regeneration techniques to improve Lead Oxide catalyst bed life.
- Replaced and re-commissioned Lead Oxide beds (\$250K capital).
- Replaced and re-commissioned Alumina Oxide/Mole Sieve catalyst beds (\$100K capital).
- Installed various pumps and valves to maintain and improve operation.

Facility Wide Accomplishments

- Engineering member for Honeywell DCS Fail Safe Controller Installation
- Flare monitoring and reporting for WV Department of Air Quality
- Site Process Hazard Analysis leader for HAZOP studies
- Design member for new Management of Change procedure for Sunoco Chemicals Ohio Valley Region
- ISO auditor

2000 – 2001 Process Engineer, AKZO Nobel Functional Chemicals, Gallipolis, WV

- Identified and resolved heat load bottlenecks for increased throughput.
- Optimized CSTR's to produce higher yields while minimizing raw material.
- Served as team leader and engineering supervisor during two new product campaigns to market.
- Plant liaison for third party engineering capital project: \$150K
- Multiple small capital projects under \$50K

1997 – 1999 Chemical Engineer Co-Op, Marathon Ashland Petroleum, Ashland, KY

- Optimization of fired heaters and steam utilities at the refinery
- Reclaimed precious metal catalyst from large reactors.
- Prepared daily reports for energy economics within refining operations.
- Worked with EPA on conditions to obtain environmental compliance.

Appendix 10-1

Instructions and Summary

Award Number: _____
Award Recipient: AmeriCarbon Products LLC

Date of Submission: 10/1/2021
Form submitted by: AmeriCarbon Products, LLC
(May be award recipient or sub-recipient)

Please read the instructions on each worksheet tab before starting. If you have any questions, please ask your DOE contact!

1. If using this form for award application, negotiation, or budget revision, fill out the blank white cells in workbook tabs a. through j. with total project costs. If using this form for invoice submission, fill out tabs a. through j. with total costs for just the proposed invoice and fill out tab k. per the instructions on that tab.
2. Blue colored cells contain instructions, headers, or summary calculations and should not be modified. Only blank white cells should be populated.
3. Enter detailed support for the project costs identified for each Category line item within each worksheet tab to autopopulate the summary tab.
4. The total budget presented on tabs a. through i. must include both Federal (DOE) and Non-Federal (cost share) portions.
5. All costs incurred by the preparer's sub-recipients, vendors, and Federal Research and Development Centers (FFRDCs), should be entered only in section f. Contractual. All other sections are for the costs of the preparer only.
6. Ensure all entered costs are allowable, allocable, and reasonable in accordance with the administrative requirements prescribed in 2 CFR 200, and the applicable cost principles for each entity type: FAR Part 31 for For-Profit entities; and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.
7. Add rows as needed throughout tabs a. through j. If rows are added, formulas/calculations may need to be adjusted by the preparer. Do not add rows to the Instructions and Summary tab. If your project contains more than three budget periods, consult your DOE contact before adding additional budget period rows or columns.
8. ALL budget period cost categories are rounded to the nearest dollar.

BURDEN DISCLOSURE STATEMENT

Public reporting burden for this collection of information is estimated to average 3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Office of Information Resources Management Policy, Plans, and Oversight, AD-241-2 - GTN, Paperwork Reduction Project (1910-5162), U.S. Department of Energy, 1000 Independence Avenue, S.W., Washington, DC 20585; and to the Office of Management and Budget, Paperwork Reduction Project (1910-5162), Washington, DC 20503.

SUMMARY OF BUDGET CATEGORY COSTS PROPOSED

The values in this summary table are from entries made in subsequent tabs, only blank white cells require data entry

Section A - Budget Summary						
	Federal	Cost Share	Total Costs	Cost Share %	Proposed Budget Period Dates	
Budget Period 1	\$743,809	\$745,000	\$1,488,809	50.04%		
Budget Period 2	\$0	\$0	\$0	0.00%		
Budget Period 3	\$0	\$0	\$0	0.00%		
Total	\$743,809	\$745,000	\$1,488,809	50.04%		
Section B - Budget Categories						
CATEGORY	Budget Period 1	Budget Period 2	Budget Period 3	Total Costs	% of Project	Comments (as needed)
a. Personnel	\$409,200	\$0	\$0	\$409,200	27.49%	
b. Fringe Benefits	\$72,948	\$0	\$0	\$72,948	4.90%	
c. Travel	\$10,088	\$0	\$0	\$10,088	0.68%	
d. Equipment	\$96,779	\$0	\$0	\$96,779	6.50%	
e. Supplies	\$17,450	\$0	\$0	\$17,450	1.17%	
f. Contractual						
Sub-recipient	\$0	\$0	\$0	\$0	0.00%	
Vendor	\$280,000	\$0	\$0	\$280,000	18.81%	
FFRDC	\$0	\$0	\$0	\$0	0.00%	
Total Contractual	\$280,000	\$0	\$0	\$280,000	18.81%	
g. Construction	\$0	\$0	\$0	\$0	0.00%	
h. Other Direct Costs	\$0	\$0	\$0	\$0	0.00%	
Total Direct Costs	\$886,465	\$0	\$0	\$886,465	59.54%	
i. Indirect Charges	\$602,344	\$0	\$0	\$602,344	40.46%	
Total Costs	\$1,488,809	\$0	\$0	\$1,488,809	100.00%	

Additional Explanation (as needed):

a. Personnel

INSTRUCTIONS - PLEASE READ!!!

1. List project costs solely for employees of the entity completing this form. All personnel costs for subrecipients and vendors must be included under f. Contractual.
2. All personnel should be identified by position title and not employee name. Enter the amount of time (e.g., hours or % of time) and the base pay rate and the total direct personnel compensation will automatically calculate. Rate basis (e.g., actual salary, labor distribution report, state civil service rates, etc.) must also be identified.
3. If loaded labor rates are utilized, a description of the costs the loaded rate is comprised of must be included in the Additional Explanation section below. DOE must review all components of the loaded labor rate for reasonableness and unallowable costs (e.g. fee or profit).
4. If a position and hours are attributed to multiple employees (e.g. Technician working 4000 hours) the number of employees for that position title must be identified.
5. Each budget period is rounded to the nearest dollar.

SOPO Task #	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hrs)	Pay Rate (\$/Hr)	Total Budget Period 1	Time (Hrs)	Pay Rate (\$/Hr)	Total Budget Period 2	Time (Hrs)	Pay Rate (\$/Hr)	Total Budget Period 3			
1	Sr. Engineer (EXAMPLE!!!)	2000	\$85.00	\$170,000	200	\$50.00	\$10,000	200	\$50.00	\$10,000	2400	\$190,000	Actual Salary
2	Technicians (2)	4000	\$20.00	\$80,000	0	\$0.00	\$0	0	\$0.00	\$0	4000	\$80,000	Actual Salary
1,2,3,4,5	Principal Investigator	875	\$175.00	\$153,125			\$0			\$0	875	\$153,125	
1,2,3,4,5	Chemical Engr Executive	125	\$125.00	\$15,625			\$0			\$0	125	\$15,625	
1,2,3,4,5	Chemical Engineer	1395	\$60.00	\$83,700			\$0			\$0	1395	\$83,700	
1,2,3,4,5	Chemical Technician (2)	2950	\$45.00	\$132,750			\$0			\$0	2950	\$132,750	
1,2,3,4,5	Project Manager	320	\$75.00	\$24,000			\$0			\$0	320	\$24,000	
				\$0			\$0			\$0	0	\$0	
				\$0			\$0			\$0	0	\$0	
				\$0			\$0			\$0	0	\$0	
				\$0			\$0			\$0	0	\$0	
				\$0			\$0			\$0	0	\$0	
				\$0			\$0			\$0	0	\$0	
				\$0			\$0			\$0	0	\$0	
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				\$0			\$0			\$0	0	\$0	
				\$0			\$0			\$0	0	\$0	
				\$0			\$0			\$0	0	\$0	
				\$0			\$0			\$0	0	\$0	
				\$0			\$0			\$0	0	\$0	
				\$0			\$0			\$0	0	\$0	
Total Personnel Costs		5665		\$409,200	0		\$0	0		\$0	0	\$409,200	

Additional Explanation (as needed):

b. Fringe Benefits

INSTRUCTIONS - PLEASE READ!!!

1. Fill out the table below by position title. If all employees receive the same fringe benefits, you can show "Total Personnel" in the Labor Type column instead of listing out all position titles.
2. The rates and how they are applied should not be averaged to get one fringe cost percentage. Complex calculations should be described/provided in the Additional Explanation section below.
3. The fringe benefit rates should be applied to all positions, regardless of whether those funds will be supported by Federal Share or Recipient Cost Share.
4. Each budget period is rounded to the nearest dollar.

Labor Type	Budget Period 1			Budget Period 2			Budget Period 3			Total Project
	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	
EXAMPLE!!! Sr. Engineer	\$170,000	20%	\$34,000	\$10,000	20%	\$2,000	\$10,000	20%	\$2,000	\$38,000
Principal Investigator	153,125	12.34%	\$18,896	0	12.34%	\$0			\$0	\$18,896
Chemical Engr Executive	15,625	13.61%	\$2,127	0	13.61%	\$0			\$0	
Chemical Engineer	83,700	17.85%	\$14,940	0	17.85%	\$0			\$0	\$14,940
Chemical Technician (2)	132,750	25.40%	\$33,719	0	25.40%	\$0			\$0	\$33,719
Project Manager	24,000	13.61%	\$3,266	0	13.61%	\$0			\$0	\$3,266
Total:	\$409,200		\$72,948	\$0		\$0	\$0		\$0	\$72,948

A federally approved fringe benefit rate agreement, or a proposed rate supported and agreed upon by DOE for estimating purposes is required at the time of award negotiation if reimbursement for fringe benefits is requested. Please check (X) one of the options below and provide the requested information if not previously submitted.

A fringe benefit rate has been negotiated with, or approved by, a federal government agency. A copy of the latest rate agreement is/was included with the project application.*

There is not a current federally approved rate agreement negotiated and available.**

*Unless the organization has submitted an indirect rate proposal which encompasses the fringe pool of costs, please provide the organization's benefit package and/or a list of the components/elements that comprise the fringe pool and the cost or percentage of each component/element allocated to the labor costs identified in the Budget Justification.

**When this option is checked, the entity preparing this form shall submit an indirect rate proposal in the format provided in the Sample Rate Proposal at <http://www1.eere.energy.gov/financing/resources.html>, or a format that provides the same level of information and which will support the rates being proposed for use in the performance of the proposed project.

Additional Explanation (as necessary): Please use this box (or an attachment) to list the elements that comprise your fringe benefits and how they are applied to your base (e.g. Personnel) to arrive at your fringe benefit rate.

c. Travel

INSTRUCTIONS - PLEASE READ!!!

1. Identify Foreign and Domestic Travel as separate items. Examples of Purpose of Travel are subrecipient site visits, DOE meetings, project mgmt. meetings, etc. Examples of Basis for Estimating Costs are past trips, travel quotes, GSA rates, etc.
2. All listed travel must be necessary for performance of the Statement of Project Objectives.
3. Federal travel regulations are contained within the applicable cost principles for all entity types. Travel costs should remain consistent with travel costs incurred by an organization during normal business operations as a result of the organizations written travel policy. In absence of a written travel policy, organizations must follow the regulations prescribed by the General Services Administration.
4. Each budget period is rounded to the nearest dollar.

SOPO Task #	Purpose of Travel	Depart From	Destination	No. of Days	No. of Travelers	Lodging per Traveler	Flight per Traveler	Vehicle per Traveler	Per Diem Per Traveler	Cost per Trip	Basis for Estimating Costs
Domestic Travel		Budget Period 1									
1	EXAMPLE!!! Visit to PV manufacturer			2	2	\$250	\$500	\$100	\$160	\$2,020	Current GSA rates
1-5	Project Kickoff	Pittsburgh, PA	North Dakota	4	2	\$450	\$800	\$150	\$236	\$3,272	
4	Inspections/Drawing Reviews	Morgantown,	Charleston, WV	2	2	\$450	NA	\$200	\$236	\$1,772	
4	Inspections/Drawing Reviews	Morgantown,	Charleston, WV	2	2	\$450	NA	\$200	\$236	\$1,772	
1-5	Project Review	Pittsburgh, PA	North Dakota	4	2	\$450	\$800	\$150	\$236	\$3,272	
International Travel										\$0	
Budget Period 1 Total										\$10,088	
Domestic Travel		Budget Period 2									
										\$0	
										\$0	
										\$0	
International Travel										\$0	
Budget Period 2 Total										\$0	
Domestic Travel		Budget Period 3									
										\$0	
										\$0	
International Travel										\$0	
Budget Period 3 Total										\$0	
PROJECT TOTAL										\$10,088	

Additional Explanation (as needed):

d. Equipment

INSTRUCTIONS - PLEASE READ!!!

1. Equipment means tangible personal property (including information technology systems) having a useful life of more than one year and a per-unit acquisition cost which equals or exceeds the lesser of the capitalization level established by the non-Federal entity for financial statement purposes, or \$5,000. Please refer to the applicable Federal regulations in 2 CFR 200 for specific equipment definitions and treatment.
2. List all equipment below, providing a basis of cost (e.g. vendor quotes, catalog prices, prior invoices, etc.). Briefly justify items as they apply to the Statement of Project Objectives. If it is existing equipment, provide logical support for the estimated value shown.
3. During award negotiations, provide a vendor quote for all equipment items over \$50,000 in price. If the vendor quote is not an exact price match, provide an explanation in the additional explanation section below. If a vendor quote is not practical, such as for a piece of equipment that is purpose-built, first of its kind, or otherwise not available off the shelf, provide a detailed engineering estimate for how the cost estimate was derived.
4. Each budget period is rounded to the nearest dollar.

SOPO Task #	Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1						
3,4,5	EXAMPLE!!! Thermal shock chamber	2	\$70,000	\$140,000	Vendor Quote - Attached	Reliability testing of PV modules- Task 4.3
4,5	Lignite coal dryer - nitrogen	1	\$15,779	\$15,779		
4	Reactor instrumentation (flow, level probe, etc.)	1	\$21,000	\$21,000		
4	High capacity slurry pumps	2	\$12,500	\$25,000		
4	Reactor hot oil/heat transfer fluid heating system	1	\$35,000	\$35,000		
				\$0		
				\$0		
	Budget Period 1 Total			\$96,779		
Budget Period 2						
				\$0		
				\$0		
				\$0		
				\$0		
				\$0		
				\$0		
	Budget Period 2 Total			\$0		
Budget Period 3						
				\$0		
				\$0		
				\$0		
				\$0		
				\$0		
				\$0		
	Budget Period 3 Total			\$0		
	PROJECT TOTAL			\$96,779		

Additional Explanation (as needed):

f. Contractual

INSTRUCTIONS - PLEASE READ!!!

1. The entity completing this form must provide all costs related to subrecipients, vendors, and FFRDC partners in the applicable boxes below.
2. Subrecipients (partners, sub-awardees): Subrecipients shall submit a Budget Justification describing all project costs and calculations when their total proposed budget exceeds either (1) \$100,000 or (2) 50% of total award costs. These subrecipient forms may be completed by either the subrecipients themselves or by the preparer of this form. The budget totals on the subrecipient's forms must match the subrecipient entries below. A subrecipient is a legal entity to which a subaward is made, who has performance measured against whether the objectives of the Federal program are met, is responsible for programmatic decision making, must adhere to applicable Federal program compliance requirements, and uses the Federal funds to carry out a program of the organization. All characteristics may not be present and judgment must be used to determine subrecipient vs. vendor status.
3. Vendors (including contractors): List all vendors and contractors supplying commercial supplies or services used to support the project. For each Vendor cost with total project costs of \$250,000 or more, a Vendor quote must be provided. A vendor is a legal entity contracted to provide goods and services within normal business operations, provides similar goods or services to many different purchasers, operates in a competitive environment, provides goods or services that are ancillary to the operation of the Federal program, and is not subject to compliance requirements of the Federal program. All characteristics may not be present and judgment must be used to determine subrecipient vs. vendor status.
4. Federal Funded Research and Development Centers (FFRDCs): FFRDCs must submit a signed Field Work Proposal during award application. The award recipient may allow the FFRDC to provide this information directly to DOE, however project costs must also be provided below.
5. Each budget period is rounded to the nearest dollar.

SOPO Task #	Sub-Recipient Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Project Total
2,4	EXAMPLE!!! XYZ Corp.	Partner to develop optimal lens for Gen 2 product. Cost estimate based on personnel hours.	\$48,000	\$32,000	\$16,000	\$96,000
						\$0
						\$0
						\$0
						\$0
						\$0
						\$0
		Sub-total	\$0	\$0	\$0	\$0

SOPO Task #	Vendor Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Project Total
6	EXAMPLE!!! ABC Corp.	Vendor for developing robotics to perform lens inspection. Estimate provided by vendor.	\$32,900	\$86,500		\$119,400
1,2,3,4	Worley	Engineering support/services for reactor design, installation and	\$250,000			\$250,000
4	Nitro Steel Fabrication	Certified Stainless Steel Reactor Fabrication - Coded vessel	\$30,000			\$30,000
						\$0
						\$0
						\$0
						\$0
		Sub-total	\$280,000	\$0	\$0	\$280,000

SOPO Task #	FFRDC Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Project Total
						\$0
						\$0
		Sub-total	\$0	\$0	\$0	\$0

	Total Contractual		\$280,000	\$0	\$0	\$280,000
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Additional Explanation (as needed):

g. Construction

PLEASE READ!!!

1. Construction, for the purpose of budgeting, is defined as all types of work done on a particular building, including erecting, altering, or remodeling. Construction conducted by the award recipient is entered on this page. Any construction work that is performed by a vendor or subrecipient should be entered under f. Contractual.

2. List all proposed construction below, providing a basis of cost such as engineering estimates, prior construction, etc., and briefly justify its need as it applies to the Statement of Project Objectives.

3. Each budget period is rounded to the nearest dollar.

Overall description of construction activities: Example Only!!! - Build wind turbine platform

SOPO Task #	General Description	Cost	Basis of Cost	Justification of need
Budget Period 1				
3	EXAMPLE ONLY!!! Three days of excavation for platform site	\$28,000	Engineering estimate	Site must be prepared for construction of platform.
	Budget Period 1 Total	\$0		
Budget Period 2				
	Budget Period 2 Total	\$0		
Budget Period 3				
	Budget Period 3 Total	\$0		
	PROJECT TOTAL	\$0		

Additional Explanation (as needed):

h. Other Direct Costs

INSTRUCTIONS - PLEASE READ!!!

1. Other direct costs are direct cost items required for the project which do not fit clearly into other categories. These direct costs must not be included in the indirect costs (for which the indirect rate is being applied for this project). Examples are: tuition, printing costs, etc. which can be directly charged to the project and are not duplicated in indirect costs (overhead costs).
2. Basis of cost are items such as vendor quotes, prior purchases of similar or like items, published price list, etc.
3. Each budget period is rounded to the nearest dollar.

SOPO Task #	General Description and SOPO Task #	Cost	Basis of Cost	Justification of need
Budget Period 1				
5	EXAMPLE!!! Grad student tuition - tasks 1-3	\$16,000	Established UCD costs	Support of graduate students working on project
Budget Period 1 Total		\$0		
Budget Period 2				
Budget Period 2 Total		\$0		
Budget Period 3				
Budget Period 3 Total		\$0		
PROJECT TOTAL		\$0		

Additional Explanation (as needed):

i. Indirect Costs

INSTRUCTIONS - PLEASE READ!!!

1. Fill out the table below to indicate how your indirect costs are calculated. Use the box below to provide additional explanation regarding your indirect rate calculation.

2. The rates and how they are applied should not be averaged to get one indirect cost percentage. Complex calculations or rates that do not correspond to the below categories should be described/provided in the Additional Explanation section below. If questions exist, consult with your DOE contact before filling out this section.

3. The indirect rate should be applied to both the Federal Share and Recipient Cost Share.

4.

NOTE: A Recipient who elects to employ the 10% de minimis Indirect Cost rate **cannot claim resulting costs as a Cost Share contribution, nor can the Recipient claim "unrecovered indirect costs" as a Cost Share contribution.** Neither of these costs can be reflected as actual indirect cost rates realized by the organization, and therefore are not verifiable in the Recipient records as required by Federal Regulation (§200.306(b)(1)).

5. Each budget period is rounded to the nearest dollar.

	Budget Period 1	Budget Period 2	Budget Period 3	Total	Explanation of BASE
Provide ONLY Applicable Rates:					
Overhead Rate	50.89%				Direct Wages
General & Administrative (G&A)	31.54%				Total Program Costs
FCCM Rate, if applicable					
OTHER Indirect Rate					
Indirect Costs (As Applicable):					
Overhead Costs	\$245,365			\$245,365	
G&A Costs	\$356,979			\$356,979	
FCCM Costs, if applicable				\$0	
OTHER Indirect Costs				\$0	
Total indirect costs requested:	\$602,344	\$0	\$0	\$602,344	

A federally approved indirect rate agreement, or rate proposed (supported and agreed upon by DOE for estimating purposes) is required if reimbursement of indirect costs is requested. Please check (X) one of the options below and provide the requested information if it has not already been provided as requested, or has changed.

An indirect rate has been approved or negotiated with a federal government agency. A copy of the latest rate agreement is included with this application, and will be provided electronically to the Contracting Officer for this project.

There is not a current, federally approved rate agreement negotiated and available*.

*When this option is checked, the entity preparing this form shall submit an indirect rate proposal in the format provided by your DOE contact, or a format that provides the same level of information and which will support the rates being proposed for use in performance of the proposed project. Additionally, any non-Federal entity that has never received a negotiated indirect cost rate, except for those non-Federal entities described in Appendix VII to Part 200—States and Local Government and Indian Tribe Indirect Cost Proposals, paragraph D.1.b, may elect to charge a de minimis rate of 10% of modified total direct costs (MTDC) which may be used indefinitely. As described in §200.403 Factors affecting allowability of costs, costs must be consistently charged as either indirect or direct costs, but may not be double charged or inconsistently charged as both. If chosen, this methodology once elected must be used consistently for all Federal awards until such time as a non-Federal entity chooses to negotiate for a rate, which the non-Federal entity may apply to do at any time.

You must provide an explanation (below or in a separate attachment) and show how your indirect cost rate was applied to this budget in order to come up with the indirect costs shown.

Additional Explanation (as needed): *IMPORTANT: Please use this box (or an attachment) to further explain how your total indirect costs were calculated. If the total indirect costs are a cumulative amount of more than one calculation or rate application, the explanation and calculations should identify all rates used, along with the base they were applied to (and how the base was derived), and a total for each (along with grand total).

Cost Share

PLEASE READ!!!

1. A detailed presentation of the cash or cash value of all cost share proposed must be provided in the table below. All items in the chart below must be identified within the applicable cost category tabs a. through i. in addition to the detailed presentation of the cash or cash value of all cost share proposed provided in the table below. Identify the source organization & amount of each cost share item proposed in the award.
2. Cash Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) for costs incurred and paid for during the project. This includes when an organization pays for personnel, supplies, equipment, etc. for their own company with organizational resources. If the item or service is reimbursed for, it is cash cost share. All cost share items must be necessary to the performance of the project. Any partial donation of goods or services is considered a discount and is not allowable.
3. In Kind Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) where a value of the contribution can be readily determined, verified and justified but where no actual cash is transacted in securing the good or service comprising the contribution. In Kind cost share items include volunteer personnel hours, the donation of space or use of equipment, etc. The cash value and calculations thereof for all In Kind cost share items must be justified and explained in the Cost Share Item section below. All cost share items must be necessary to the performance of the project. If questions exist, consult your DOE contact before filling out In Kind cost share in this section. Vendors may not provide cost share. Any partial donation of goods or services is considered a discount and is not allowable.
4. Funds from other Federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC sub-recipients. Non-Federal sources include any source not originally derived from Federal funds. Cost sharing commitment letters from subrecipients and third parties must be provided with the original application.
5. Fee or profit, including foregone fee or profit, **are not allowable** as project costs (including cost share) under any resulting award. The project may only incur those costs that are allowable and allocable to the project (including cost share) as determined in accordance with the applicable cost principles prescribed in FAR Part 31 for For-Profit entities and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.
6. **NOTE:** A Recipient who elects to employ the 10% de minimis Indirect Cost rate **cannot claim the resulting indirect costs as a Cost Share contribution.**
7. **NOTE:** A Recipient **cannot claim "unrecovered indirect costs"** as a Cost Share contribution, **without prior approval.**
8. Each budget period is rounded to the nearest dollar.

Organization/Source	Type (Cash or In Kind)	Cost Share Item	Budget Period 1	Budget Period 2	Budget Period 3	Total Project Cost Share
ABC Company EXAMPLE!!!	Cash	Project partner ABC Company will provide 20 PV modules for product development at the price of \$680 per module	\$13,600			\$13,600
AmeriCarbon	In Kind		\$725,000			\$725,000
NACoal	In Kind		\$20,000			\$20,000
						\$0
						\$0
						\$0
						\$0
						\$0
						\$0
		Totals	\$745,000	\$0	\$0	\$745,000

Total Project Cost: \$1,488,809

Cost Share Percent of Award: 50.04%

Additional Explanation (as needed):

Appendix 11-1

North American COAL

March 29, 2024

AmeriCarbon Products, LLC
Attention: Mr. David A. Berry, CEO
3001 Cityview Drive
Morgantown, WV 26501

Subject: Matching Funds Commitment Letter

The North American Coal Corporation (NACoal), a NACCO Natural Resources company, is pleased to support your application for the AmeriCarbon Products, LLC (“AmeriCarbon”) in its proposal to the Lignite Energy Council with respect to the North Dakota Industrial Commission (NDIC) research grant program under the title *Lignite Conversion Reactor Optimization for Commercial Carbon Pitch Manufacturing*. The conversion of coal resources into beneficial value-added products is an important area of interest for NACoal.

NACoal is the largest lignite producer in the United States and one of the top 10 coal producers in the United States. We mine and market coal for use in power generation, SNG production, activated carbon production, as well as, providing selected value-added mining services for other natural resources companies. Our corporate headquarters are in Plano, Texas, near Dallas, and we operate surface coal mines in North Dakota, Mississippi, Texas, and Louisiana

We support the NDIC’s and AmeriCarbon’s efforts of developing lignite coal as a feedstock for the manufacture of critical materials and advanced carbon products. Successful implementation of a strategic approach to developing this critical supply chain opportunity can lead to significant job creation and economic development in North Dakota.

If the grant is awarded to your project, NACoal will be pleased to provide up to \$20,000 in in-kind support in the form of coal samples and time for the project that can be used as cost share. We look forward to working with the you on this exciting opportunity. If you have questions or require additional information, please do not hesitate to contact me at the letterhead address or Gerard Goven at 701-250-2604.

Very truly yours,
THE NORTH AMERICAN COAL CORPORATION



George Lovland, P.E.
Engineering Manager

North American Coal
5340 Legacy Drive, Suite #300
Plano, TX 75024
972.448.5400
NACoal.com

 A NACCO COMPANY



Worley Group, Inc.
2910 Valley Forge St
Bismarck, ND 58503

28 March 2024

David A Berry, CEO
AmeriCarbon Products LLC.
3001 Cityview Drive
Morgantown, WV 26501

Subject: Letter of Support for the North Dakota Industrial Commission (NDIC) research grant program under the title *Lignite Conversion Reactor Optimization for Commercial Carbon Pitch Manufacturing*

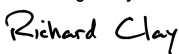
Worley is pleased to express interest in supporting the efforts of AmeriCarbon Products, LLC in commercial engineering design & scaleup for its proprietary coal to pitch (EcoPitch™) technology.

With an office in Bismarck, North Dakota, Worley is a global engineering, procurement, and construction company that provides innovative solutions in the energy, chemicals, resources, and infrastructure sectors. With a comprehensive range of services, our firm is known for our expertise in designing, managing, and implementing complex projects across the globe. Our firm is committed to sustainable practices and focuses on delivering projects that contribute to the development of a more sustainable and resilient future. Worley collaborates with clients to address challenges in areas such as oil and gas, mining, power generation, and environmental management.

Worley will provide engineering services to AmeriCarbon to help support the proposed project. Engineering services will include design, installation, and operational support throughout all phases of the reactor optimization project. Worley will offer this supporting service to AmeriCarbon at a budgeted value of \$250K commensurate with the agreed upon project deliverables scope and projected timeline.

Worley is proud to support AmeriCarbon's cutting-edge research and development project to help accelerate the development of commercial scale production in North Dakota. Leveraging our extensive experience in the energy and resources sectors, Worley brings a wealth of knowledge and innovative engineering solutions to propel the project forward, contributing to the advancement of environmentally conscious technologies and resource utilization.

Respectfully,

DocuSigned by:

839CE3643883468...

Richard Clay
Director of Operations, US East (Charleston WV Office)

cc: Scott Midle | Kevin Legg | Pete Cowger |



April 1, 2024

State of North Dakota
The Industrial Commission
State Capitol
Bismarck, ND 58505
ATTN: Lignite Research Program

RE: Matching Funds Commitment Letter

This is to confirm that the applicant, AmeriCarbon Products, LLC, is committed to providing \$725,000 in in-kind services, including personnel time, indirect, and overhead expenses, with respect to the project proposed with the title *Lignite Conversion Reactor Optimization for Commercial Carbon Pitch Manufacturing*. To the extent there are any shortfalls from the cost share to be provided by The North American Coal Corporation, AmeriCarbon will provide additional cost share to address such shortfalls up to a total of \$745,000.

We look forward to working with the North Dakota Industrial Commission and the Lignite Energy Council to discuss the enclosed proposal. If you have any questions, I may be reached at (304) 685-6017 or greg.henthorn@americarbon.com.

Sincerely,

Greg Henthorn
Vice President of Corporate Development
AmeriCarbon Products, LLC



(888) 367-1650



www.americarbon.com



3001 City View Drive
Morgantown, WV 26501

Appendix 13-I

AFFIDAVIT

In reference to Section 43-03-04-01, North Dakota Century Code, the undersigned, Gregory Henthorn, Vice President, Corporate Development of AmeriCarbon Products, LLC, a West Virginia limited liability company with a tax mailing address of 3001 Cityview Drive, Morgantown, West Virginia, 26501, being first duly sworn according to law, deposes and states as follows:

1. I am at least 18 years of age.
2. I have personal knowledge regarding the facts as set forth herein.
3. I am the Vice President, Corporate Development of AmeriCarbon Products, LLC, a West Virginia limited liability company (“**AmeriCarbon**”).
4. AmeriCarbon does not have an outstanding tax liability owed to the State of North Dakota or any of its political subdivisions.
5. I declare under penalty of perjury under the law of North Dakota that the foregoing is true and correct.

Further Affiant sayeth naught.

Executed and acknowledged by:



Gregory Henthorn

[Continued on the following page.]

JURAT

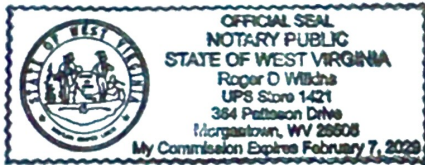
STATE OF WEST VIRGINIA :

:

COUNTY OF MONONGALIA :

The foregoing instrument was subscribed to and sworn before me this 1st day of April, 2024, by Gregory Henthorn.

[Notarial Seal]





Notary Public

My Commission Expires 02/07/2029

This instrument was prepared by:
AmeriCarbon Products, LLC, 3001 Cityview Drive, Morgantown, West Virginia, 26501

Lignite Research Council

May 9, 2024

Reice Haase – Deputy Executive Director – ND Industrial Commission

Claire Vigesaa – Executive Director -ND Transmission Authority

IIJA Grid Resilience Grant Round 1

DOE Award (FY22 & FY23) -May 2023 \$7,499,037

68th ND Legislative Assembly (15%) Match \$1,124,856

\$8,623,893

Administrative Contract - EERC

IIJA Grid Resilience Grant Round 1

- ❑ Twelve Applications Received (Nov 2023)
- ❑ Total Project Costs \$33,102,334
- ❑ Total Grant Request - \$17,355,257
- ❑ **Total Grant Dollars Available \$8,183,093**

IIJA Grid Resilience Grant Round 1 Highlights

Utility	Award (\$)	Project Description
Capital Electric Cooperative	\$321,930	Converting OVHD to URD State/Fed Hwy Crossings
Otter Tail Power Company	\$4,432,088	Next-Generation Grid Resiliency
Northern Plains Electric Cooperative	\$586,000	Electronic SCADA Recloser Installation
McKenzie Electric Cooperative	\$2,843,075	Capacitor Banks, Communications, SCADA Controls



\$21 invested for every state dollar appropriated



Over 750 miles of power line upgrades



54 overhead crossings converted to underground



Deployment of new technologies for inspections and vegetation management

FY24 IIJA Grid Resilience Grant Round 2

January 2024 ND Industrial Commission

Gave NDIC staff authority to pursue FY24 Formula Grant

DOE IIJA FY24 Formula Grant	\$3,885,295
State (15% Match required)	\$ 582,795

15% Match

Timing “off” for Legislative Appropriation

Emergency Commission Funding Limited

Therefore: Request gap coverage for the 15% match from the Lignite Research Council until a request can be made to the 69th ND Legislature.

Likely not drawn upon...timing of the Legislature and project award construction...spring 2025?

N O R T H
Dakota

Be Legendary.



Financial Statements
December 31, 2023 and 2022

North Dakota Guaranteed Student Loan Program

NORTH DAKOTA GUARANTEED STUDENT LOAN PROGRAM

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Independent Auditor's Report

Governor of North Dakota and
the Legislative Assembly
State of North Dakota
Bismarck, North Dakota

Report on the Audit of the Financial Statements

Opinion

We have audited the financial statements of the business-type activities of North Dakota Guaranteed Student Loan Program (the Program), an enterprise fund of the State of North Dakota, as of and for the years ended December 31, 2023 and 2022, and the related notes to the financial statements, which collectively comprise the Program's basic financial statements as listed in the table of contents.

In our opinion, the accompanying financial statements referred to above present fairly, in all material respects, the respective financial position of the business-type activities of the Program, as of December 31, 2023 and 2022, and the respective changes in its financial position and cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

We conducted our audit in accordance with auditing standards generally accepted in the United States of America (GAAS) and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States (*Government Auditing Standards*). Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the Program, and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Emphasis of Matter

Reporting Entity

As discussed in Note 1, the financial statements of North Dakota Guaranteed Student Loan Program are intended to present the financial position, the changes in financial position and cash flows of only that portion of the State of North Dakota that is attributable to the transactions of North Dakota Guaranteed Student Loan Program. They do not purport to, and do not, present fairly the financial position of the State of North Dakota as of December 31, 2023 and 2022 and the changes in its financial position and its cash flows for the years then ended in conformity with accounting principles generally accepted in the United States of America. Our opinion is not modified with respect to this matter.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinions. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS and *Government Auditing Standards* will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with GAAS and *Government Auditing Standards*, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Program internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis be presented to supplement the basic financial statements. Such information is the responsibility of management and although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with GAAS, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated March 21, 2024 on our consideration of the Program's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the Program's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Program's internal control over financial reporting and compliance.

Eide Bailly LLP

Bismarck, North Dakota
March 21, 2024

NORTH DAKOTA GUARANTEED STUDENT LOAN PROGRAM MANAGEMENT'S DISCUSSION AND ANALYSIS DECEMBER 31, 2023, 2022, AND 2021

The North Dakota Guaranteed Student Loan Program (the Program) has been designated to act as a guarantor of private student loans originated by the Bank of North Dakota (the Bank). The Program is responsible for processing loans submitted for guarantee, issuing loan guarantees, paying lender claims for loans, and collection of loans on which default claims have been paid.

Note 1 to the financial statements provides a discussion of the organization and significant accounting policies of the Program. The financial statements of the Program provide accounting information similar to that of many other business entities. The Statement of Net Position summarizes the assets, liabilities and net position of the Program and provides the basis for analysis of the soundness and liquidity of the organization. The Statement of Revenues, Expenses and Changes in Net Position summarizes the success of the organization in carrying out its business over the course of the most recent fiscal periods. The Statement of Cash Flows summarizes the flow of cash through the organization as it conducts its business.

The discussion and analysis of the financial performance of the Program which follows is meant to provide additional insight into the Program's activities for the fiscal years ended December 31, 2023, 2022, and 2021. Please read it in conjunction with the Program's financial statements and footnotes which are presented elsewhere in this report. Please note that the Program continues to have adequate resources to act as a guarantor of student loans and the auditor's opinion which accompanies the financial statements is unmodified.

FINANCIAL HIGHLIGHTS

Alternative Loan Fund guarantees during the years ending December 31, 2023, 2022, and 2021 were \$69 million, \$83 million, and \$100 million, respectively.

Alternative Loan Fund guarantees outstanding at December 31, 2023, 2022, and 2021 was \$1.047 billion, \$1.084 billion, and \$1.123 billion, respectively.

As of April 1, 2024, Bank of North Dakota will only offer student loans to North Dakota residents attending an eligible in-state and out-of-state school, and out-of-state residents attending a North Dakota school. As a result, Alternative Loan Fund guarantees will continue to decline.

State law requires that the Program maintain a reserve fund on deposit with the Bank for all outstanding Alternative Loans. The fund level may be no less than the Bank of North Dakota historical default rate. The Statement of Net Position indicates that the Alternative Loan Fund has adequate resources to provide for new loan guarantees, claim payments to lenders, and continuing obligations.

**NORTH DAKOTA GUARANTEED STUDENT LOAN PROGRAM
MANAGEMENT'S DISCUSSION AND ANALYSIS
DECEMBER 31, 2023, 2022, AND 2021**

CONDENSED STATEMENTS OF NET POSITION

	(In Thousands)		
	2023	2022	2021
ASSETS			
Cash and cash equivalents	\$ 49,651	\$ 50,189	\$ 51,727
Receivables	-	43	217
TOTAL ASSETS	\$ 49,651	\$ 50,232	\$ 51,944
LIABILITIES			
Current liabilities			
Allowance for future credit losses	\$ 27,639	\$ 29,297	\$ 31,553
Estimated future refunds of default aversion fees	-	2	2
Collections payable	434	478	-
Other	5	5	5
Total liabilities	28,078	29,782	31,560
NET POSITION - UNRESTRICTED	21,573	20,450	20,384
TOTAL LIABILITIES AND NET POSITION	\$ 49,651	\$ 50,232	\$ 51,944

Cash and Cash Equivalents

The Program considers all cash and time deposits with original maturities of three months or less to be cash and cash equivalents for purposes of reporting cash flows. Cash and cash equivalents decreased by \$0.5 million and \$1.5 million in 2023 and 2022, respectively, primarily due to credit loss claim payments to the bank, offset by administrative fees and loan recoveries.

Receivables

The receivable balances consist of administrative fees due to the Program from the Bank of North Dakota as of the end of each year. In 2023 the administrative fee due to the Program from the Bank of North Dakota was reduced to zero from July 1, 2023 through December 31, 2023. The change in fee was a result of the decreasing student loan portfolio and decline in claim payments. The decrease from 2021 to 2022 was due to a lower in-state fee rate paid to the program by Bank of North Dakota.

Allowance for Credit Losses

The Program estimates the allowance for future credit losses based on management's evaluation of a number of factors, including recent credit loss experience, continuous evaluation of outstanding loans guaranteed, current and anticipated economic conditions, and other pertinent factors. As of December 31, 2023, the Program considers the allowance for future credit losses of \$27.6 million adequate to cover losses on Alternative loans. Allowance for future credit losses was \$29.3 million and \$31.6 million as of December 31, 2022 and 2021, respectively.

NORTH DAKOTA GUARANTEED STUDENT LOAN PROGRAM
MANAGEMENT'S DISCUSSION AND ANALYSIS
DECEMBER 31, 2023, 2022, AND 2021

CONDENSED STATEMENTS OF REVENUES, EXPENSES AND CHANGES IN NET POSITION

	(In Thousands)		
	2023	2022	2021
OPERATING REVENUES			
Administrative fee	\$ 1,585	\$ 2,479	\$ 3,953
OPERATING EXPENSES			
Service and administrative expense	822	812	703
Credit loss expense	(79)	1,653	3,430
	<u>743</u>	<u>2,465</u>	<u>4,133</u>
OPERATING INCOME (LOSS)	842	14	(180)
NONOPERATING REVENUES			
Interest income	281	52	42
INCOME (LOSS) BEFORE TRANSFERS	1,123	66	(138)
CHANGE IN NET POSITION	1,123	66	(138)
TOTAL NET POSITION - BEGINNING OF YEAR	20,450	20,384	20,522
TOTAL NET POSITION - END OF YEAR	<u>\$ 21,573</u>	<u>\$ 20,450</u>	<u>\$ 20,384</u>

Operating Revenues and Expenses

Note 1 to the financial statements contains discussion of several of the various operating revenue and expense items pertaining to Program operations. Administrative fees decreased \$0.9 million and \$1.5 million during the years ended December 31, 2023 and 2022, respectively, primarily due to a decrease in the in-state rate paid by BND and decrease in new loan volume.

Service and Administrative Expense - Bank of North Dakota

The Program has entered into a number of agreements as discussed in Note 5 to the financial statements pertaining to related party transactions. Several of these agreements resulted in payments between the various parties either to pay claims on student loans guaranteed by the Program or to fund operations of the Program.

Credit Loss Expense

Credit loss expense was (\$0.79) million during the year ended December 31, 2023, \$1.7 million during the year ended December 31, 2022, and \$3.4 million during the year ended December 31, 2021. The decrease from 2022 to 2023 and 2021 to 2022 was primarily due to the decrease in the student loan portfolio.

**NORTH DAKOTA GUARANTEED STUDENT LOAN PROGRAM
MANAGEMENT'S DISCUSSION AND ANALYSIS
DECEMBER 31, 2023, 2022, AND 2021**

Budgetary Information

As discussed in Note 1 to the financial statements, the North Dakota Century Code designates the Bank as the agency to administer the Program. The Bank's operations are funded under a biennial appropriation approved by the state legislature which encompasses the Bank's operations, including those of the Program. Section 15-62.1-01 of the North Dakota Century Code also provides continuing appropriation authority to expend monies received and interest earned as may be necessary to implement and administer the Program. Since the legislature does not identify separate appropriation funding for the Program, it is not possible to prepare an analysis of actual performance to appropriation for the Program.

Contacting the North Dakota Guaranteed Student Loan Program's Financial Management

The information in this report is intended to provide the reader with an overview of the results of the Program's operations along with the Program's accountability for those operations. If you have questions or require additional information, contact us at PO Box 5524, Bismarck, ND 58506-5524, or call us at 701-328-5654.

NORTH DAKOTA GUARANTEED STUDENT LOAN PROGRAM
STATEMENTS OF NET POSITION
DECEMBER 31, 2023 AND 2022

	<u>2023</u>	<u>2022</u>
ASSETS		
Cash and cash equivalents		
Unrestricted	\$ 49,650,952	\$ 50,186,679
Restricted	-	1,843
Receivables		
Administrative fee	-	43,097
TOTAL ASSETS	<u><u>\$ 49,650,952</u></u>	<u><u>\$ 50,231,619</u></u>
LIABILITIES		
CURRENT LIABILITIES		
Due to BND	\$ 5,000	\$ 5,000
Collections payable	433,846	477,574
Allowance for future credit losses	(78,729)	1,652,564
Estimated future refunds of default aversion fees	-	1,843
Total current liabilities	<u>360,117</u>	<u>2,136,981</u>
NONCURRENT LIABILITIES		
Allowance for future credit losses	<u>27,717,909</u>	<u>27,644,871</u>
Total liabilities	<u>28,078,026</u>	<u>29,781,852</u>
NET POSITION - UNRESTRICTED	<u>21,572,926</u>	<u>20,449,767</u>
TOTAL LIABILITIES AND NET POSITION	<u><u>\$ 49,650,952</u></u>	<u><u>\$ 50,231,619</u></u>

NORTH DAKOTA GUARANTEED STUDENT LOAN PROGRAM
STATEMENTS OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
YEARS ENDED DECEMBER 31, 2023 AND 2022

	<u>2023</u>	<u>2022</u>
OPERATING REVENUES		
Administrative fee	\$ 1,584,786	\$ 2,478,655
OPERATING EXPENSES		
Service and administrative expense	821,374	812,091
Credit loss expense	<u>(78,729)</u>	<u>1,652,564</u>
	<u>742,645</u>	<u>2,464,655</u>
OPERATING INCOME	842,141	14,000
NONOPERATING REVENUES		
Interest income	<u>281,018</u>	<u>52,137</u>
CHANGE IN NET POSITION	1,123,159	66,137
TOTAL NET POSITION, BEGINNING OF YEAR	<u>20,449,767</u>	<u>20,383,630</u>
TOTAL NET POSITION, END OF YEAR	<u>\$ 21,572,926</u>	<u>\$ 20,449,767</u>

NORTH DAKOTA GUARANTEED STUDENT LOAN PROGRAM
STATEMENTS OF CASH FLOWS
YEARS ENDED DECEMBER 31, 2023 AND 2022

	<u>2023</u>	<u>2022</u>
OPERATING ACTIVITIES		
Loan recoveries received from borrowers	\$ 1,688,076	\$ 1,417,010
Credit loss claims paid to BND	(3,311,330)	(4,824,007)
Credit loss claims paid to North Dakota Student Loan Trust	-	(23,892)
Administrative fee received from borrowers	1,627,883	2,652,616
Service and administrative expense paid to BND	(821,374)	(812,091)
Refunds of default aversion fees	(1,843)	(384)
NET CASH (USED FOR) OPERATING ACTIVITIES	<u>(818,588)</u>	<u>(1,590,748)</u>
INVESTING ACTIVITIES		
Interest received	<u>281,018</u>	<u>52,137</u>
NET CASH FROM INVESTING ACTIVITIES	<u>281,018</u>	<u>52,137</u>
NET CHANGE IN CASH AND CASH EQUIVALENTS	<u>(537,570)</u>	<u>(1,538,611)</u>
CASH AND CASH EQUIVALENTS, BEGINNING OF YEAR	<u>50,188,522</u>	<u>51,727,133</u>
CASH AND CASH EQUIVALENTS, END OF YEAR	<u>\$ 49,650,952</u>	<u>\$ 50,188,522</u>
RECONCILIATION OF OPERATING INCOME TO NET CASH (USED FOR) OPERATING ACTIVITIES		
Operating income	\$ 842,141	\$ 14,000
Adjustments to reconcile operating income to net cash from/(used for) operating activities		
Changes in assets and liabilities:		
Administrative fee receivable - BND	43,097	173,961
Allowance for future credit losses	(1,658,255)	(2,255,899)
Refunds of default aversion fees	(1,843)	(384)
Collections payable	(43,728)	477,574
NET CASH (USED FOR) OPERATING ACTIVITIES	<u>\$ (818,588)</u>	<u>\$ (1,590,748)</u>

NORTH DAKOTA GUARANTEED STUDENT LOAN PROGRAM
NOTES TO FINANCIAL STATEMENTS
YEARS ENDED DECEMBER 31, 2023 AND 2022

NOTE 1 - SIGNIFICANT ACCOUNTING POLICIES

Nature of Operations

Section 15-62.1 of the North Dakota Century Code (NDCC) designates the Bank of North Dakota (the Bank) as the agency for the administration of the North Dakota Guaranteed Student Loan Program (the Program). The Program shall expend monies received and interest on the reserve funds established pursuant to this section of the NDCC as may be necessary to implement and administer the Program. The Program has been designated to act as a guarantor of private student loans originated by the Bank. The Program is responsible for processing loans submitted for guarantee, issuing loan guarantees, paying lender claims for loans, and collecting loans on which default claims have been paid. Program funds may also be used for application processing, loan disbursement, enrollment and repayment status management, default aversion activities, default collection activities, school and lender training, financial aid awareness and related outreach activities, compliance monitoring, and other student financial aid related activities as selected by the Program.

Reporting Entity

In accordance with Governmental Accounting Standards Board (GASB) Statement No. 61, *The Financial Reporting Entity: Omnibus*, the Program should include all component units over which the Program exercises such aspects as (1) appointing a voting majority of an organization's governing body and (2) has the ability to impose its will on that organization, or (3) the potential for the organization to provide specific financial benefits to, or impose specific financial burdens on the Program. Based on that criteria, no organizations were determined to be part of the Program. The Program is included as part of the primary government in the State of North Dakota's reporting.

Accounting Standards

The Program follows the pronouncements of the Governmental Accounting Standards Board, which is the nationally accepted standard setting body for establishing generally accepted accounting principles for governmental entities.

Fund Accounting

The Program is an enterprise fund and uses the accrual basis of accounting. Under the accrual basis of accounting, revenues are recorded when earned and expenses are recorded at the time liabilities are incurred.

Basis of Accounting and Measurement Focus

The accounting and financial reporting treatment applied to a fund is determined by its measurement focus. All enterprise funds are accounted for using the economic resources measurement focus. With this measurement focus, all assets and liabilities associated with the operation of these funds are included on the statement of net position. Net position is segregated into net investment in capital assets, restricted, and unrestricted components. The statement of revenues, expenses and changes in net position present increases (e.g., revenues) and decreases (e.g., expenses) in total net position. The statement of cash flows presents the cash flows for operating activities, investing activities and non-capital financing activities.

NORTH DAKOTA GUARANTEED STUDENT LOAN PROGRAM
NOTES TO FINANCIAL STATEMENTS
YEARS ENDED DECEMBER 31, 2023 AND 2022

Use of Estimates

In preparing financial statements in conformity with accounting principles generally accepted in the United States of America, management is required to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the statement of net position and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from these estimates. Material estimates that are particularly susceptible to significant change in the near-term relate to the determination of the allowance for future credit losses and claims payable to lenders. Claims payable to lenders reflects a net principal balance outstanding on DEAL loans that are 270 days or greater delinquent as of current fiscal year end.

Cash and Cash Equivalents

The Program considers all cash and time deposits with original maturities of three months or less to be cash and cash equivalents for purposes of reporting cash flows.

Administrative Fee Revenue

Administrative fee revenue is to be used by the Program to insure loans and to cover costs incurred in the administration of the Alternative Loan Fund. The revenue is recognized at the time of loan disbursement.

Estimated Future Refunds of Default Aversion Fees

As discussed in Note 3, the Program entered into an agreement with Great Lakes Higher Education to refund default aversion fees on loans that entered claim status that had been earned by the Program prior to the transfer of guaranteed federal student loans.

Credit Loss Expenses

The Program estimates the allowance for future credit losses based on management's evaluation of a number of factors, including recent credit loss experience, continuous evaluation of outstanding loans guaranteed, current and anticipated economic conditions, and other pertinent factors.

Restricted Assets

The Program has restricted cash for the estimated future refunds of default aversion fees obligated to Great Lakes Higher Education.

Operating and Non-Operating Revenues

Operating revenues consist of administrative fees, quasi-external operating transactions with other funds, grant revenue for specific activities that are considered to be operating activities of the grantor, receipts from other agencies for reimbursement of operating transactions and other miscellaneous revenue. Grants that would qualify as an operating activity are those that do not subsidize an existing program, rather they finance a program the agency would not otherwise undertake. All other revenues that do not meet the above criteria are classified as non-operating.

NORTH DAKOTA GUARANTEED STUDENT LOAN PROGRAM
NOTES TO FINANCIAL STATEMENTS
YEARS ENDED DECEMBER 31, 2023 AND 2022

Change in Accounting Estimate

The Program changed allowance methodology from incurred loss methodology to an expected loss methodology referred to as current expected credit losses. This shift from incurred losses to expected losses aims to provide a more forward-looking and comprehensive assessment of credit risk. Results for reporting periods beginning after January 1, 2023 are posted under the current expected credit losses methodology, while prior period amounts continue to be reported under the incurred loss methodology. Financial statement line items affected by the change in accounting estimate include allowance for credit losses and credit loss expense. The net impact to change in net position was \$975,802 during 2023 for the change in estimate.

NOTE 2 - DEPOSITS AND INVESTMENTS

The Program has moneys invested in securities or deposits allowed by state regulations. North Dakota Century Code Section 15-62.1-05 states that securities in which moneys of the Program may be invested must meet the same requirements as those authorized for investment under the state investment board.

Deposits

As of December 31, 2023 and 2022, the Program had cash deposits held at the Bank of \$49,650,952 and \$50,188,522, respectively.

Custodial and Concentration of Credit Risk

Custodial credit risk for deposits is the risk that, in the event of the failure of a depository financial institution, the Program will not be able to recover deposits or will not be able to recover collateral securities that are in the possession of an outside party. The Program does not have a formal policy that limits custodial credit risk for deposits. None of the Program's deposits are covered by depository insurance. The Program's deposits are uncollateralized and all of the deposits are held at the Bank of North Dakota and are guaranteed by the State of North Dakota (NDCC Section 6-09-10).

NOTE 3 – DEFAULT AVERSION FEES AND ESTIMATED FUTURE REFUNDS

Upon the transfer of all Federal guarantees to Great Lakes Higher Education, the Program agreed to pay Great Lakes \$354,143 for future refunds at the time of the transfer, with the potential of an additional transfer of up to \$167,900 reserved through September 30, 2024.

	<u>2023</u>	<u>2022</u>
Balance, beginning of year	\$ 1,843	\$ 2,227
Payment to Great Lakes	(1,843)	(384)
Balance, end of year	<u>\$ -</u>	<u>\$ 1,843</u>

NORTH DAKOTA GUARANTEED STUDENT LOAN PROGRAM
NOTES TO FINANCIAL STATEMENTS
YEARS ENDED DECEMBER 31, 2023 AND 2022

NOTE 4 – ALLOWANCE FOR CREDIT LOSSES

Changes in the allowance for future credit losses for the years ending December 31, 2023 and 2022 are as follows:

	<u>2023</u>	<u>2022</u>
Balance, beginning of year	\$ 29,297,435	\$ 31,553,334
Credit loss expense	(78,729)	1,652,564
Recoveries	1,688,076	1,417,010
Claims paid	<u>(3,267,602)</u>	<u>(5,325,473)</u>
Balance, end of year	<u>\$ 27,639,180</u>	<u>\$ 29,297,435</u>

NOTE 5 - INTERFUND AND RELATED PARTY TRANSACTIONS

	<u>2023</u>	<u>2022</u>
BANK OF NORTH DAKOTA		
Cash and cash equivalents - unrestricted	\$ 49,650,952	\$ 50,186,679
Cash and cash equivalents - restricted	-	1,843
Administrative fee receivable	-	43,097
Due to BND	5,000	5,000

During the year ended December 31, 2023 and 2022, the Program paid \$461,579 and \$442,434, respectively, to the Bank for reimbursement of expenses paid by the Bank on behalf of the Program, which includes \$461,579 and \$442,434 for direct costs specifically identifiable with the Program. The payable to the Bank for such expenses, amounting to \$5,000 and \$5,000 at December 31, 2023 and 2022, respectively, is included in "Due To BND" on the statement of net position. The Program received administrative fees from the Bank of \$994,237 and \$1,847,100 during the years ended December 31, 2023 and 2022, respectively. This decrease was due to a reduction of the in-state rate paid by BND during the fiscal year of 2023.

As of December 31, 2023 and 2022, the Program has guaranteed approximately \$1.05 billion and \$1.08 billion of loans owned by the Bank and the Trust, respectively. The Program paid claims of approximately \$3.3 million and \$4.8 million to the Bank and the Trust for the years ended December 31, 2023 and 2022, respectively. Some of those loans were subsequently rehabilitated and sold to the Bank.

NORTH DAKOTA GUARANTEED STUDENT LOAN PROGRAM
NOTES TO FINANCIAL STATEMENTS
YEARS ENDED DECEMBER 31, 2023 AND 2022

NOTE 6 - RISK MANAGEMENT

The Program is exposed to various risks of loss related to torts and errors and omissions. The Program is administered by the Bank and, therefore, is eligible to the same funds/pools established by the State for risk management issues. These include:

The 1995 Legislative Session established the Risk Management Fund (RMF), an internal service fund, to provide a self-insurance vehicle for funding the liability exposures of State Agencies resulting from the elimination of the State's sovereign immunity. The RMF manages the tort liability of the State, its agencies' employees, and the University System. All State agencies participating in the RMF and their fund contribution was determined using a projected cost allocation approach. The statutory liability of the State is limited to a total of \$250,000 per person and \$1,000,000 per occurrence.

The State Bonding Fund currently provides the Bank with blanket employee fidelity bond coverage in the amount of \$2,000,000. The State Bonding Fund does not currently charge any premium for this coverage.

There have been no significant reductions in insurance coverage from the prior year and settled claims resulting from these risks have not exceeded insurance coverage.



Independent Auditor's Report on Internal Control over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance with *Government Auditing Standards*

To the Governor of North Dakota and
the Legislative Assembly
North Dakota Guaranteed Student Loan Program
Bismarck, North Dakota

We have audited, in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States (Government Auditing Standards), the financial statements of the of the business-type activities of the North Dakota Guaranteed Student Loan Program (the Program), an enterprise fund of the State of North Dakota, as of and for the years ended December 31, 2023, and the related notes to the financial statements, which collectively comprise the Program's basic financial statements, and have issued our report thereon dated March 21, 2024.

Report on Internal Control over Financial Reporting

In planning and performing our audit of the financial statements, we considered the Program's internal control over financial reporting (internal control) as a basis for designing audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the Program's internal control. Accordingly, we do not express an opinion on the effectiveness of the Program's internal control.

A deficiency in internal control exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A material weakness is a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A significant deficiency is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses or significant deficiencies may exist that were not identified

Report on Compliance and Other Matters

As part of obtaining reasonable assurance about whether the Program's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the financial statements. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

Eide Bailly LLP

Bismarck, North Dakota
March 21, 2024



**North Dakota Guaranteed Student Loan Program
Auditor's Specific Comments Requested by the North Dakota Legislative Audit and Fiscal Review
Committee
Year Ended December 31, 2023**

Governor of North Dakota
and the Legislative Assembly
State of North Dakota
Bismarck, North Dakota

The Legislative Audit and Fiscal Review Committee requires a separate audit summary from certified public accountants performing audits of state agencies. The separate audit summary regarding the December 31, 2023 audit of North Dakota Guaranteed Student Loan Program is as follows:

Purpose of the Audit

North Dakota Guaranteed Student Loan Program is a component of the financial statements of the state of North Dakota. The purpose of the audit of North Dakota Guaranteed Student Loan Program is to express an opinion on each financial statement opinion unit.

The objectives of our audit of the financial statements are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with auditing standards generally accepted in the United States of America (GAAS) and in accordance with Government Auditing Standards, will always detect a material misstatement when it exists. Misstatements, including omissions, can arise from fraud or error and are considered material if there is a substantial likelihood that, individually and in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

Type of Audit Opinion

We issued an unmodified opinion on the financial statements of North Dakota Guaranteed Student Loan Program.

Findings and Recommendations

We have no findings or recommendations to communicate as a result of the audit.

Status of Prior Recommendations

There were no findings or recommendations communicated in the prior audit.

Explanations of Significant Audit Adjustments and Misstatements

There were no significant audit adjustments or uncorrected misstatements that were identified as a result of our audit procedures.

Disagreements with Management or Difficulties Encountered during the Audit

No disagreements with management arose during the course of the audit.

We encountered no significant difficulties in dealing with management relating to the performance of the audit.

Other Audit Report Highlights

None

Cost of the Audit Compared to the Prior Audit

The cost of the 2023 North Dakota Guaranteed Student Loan Program audit was \$27,200.

The cost of the 2022 North Dakota Guaranteed Student Loan Program audit was \$24,780.

This report is intended solely for the information and use of the Governor of North Dakota, Legislative Assembly, North Dakota Industrial Commission, Bank of North Dakota Advisory Board and management of the Program, and is not intended to be and should not be used by anyone other than these specified parties.



Bismarck, North Dakota
March 21, 2024



March 21, 2024

Governor of North Dakota and
the Legislative Assembly
Beginning Farmer Revolving Loan Program
Bismarck, North Dakota

We have audited the financial statements of the business-type activities of North Dakota Guaranteed Student Loan Program (the Program) as of and for the year ended December 31, 2023, and have issued our report thereon dated March 21, 2024. Professional standards require that we advise you of the following matters relating to our audit.

Our Responsibility in Relation to the Financial Statement Audit

As communicated in our letter dated January 16, 2024, our responsibility, as described by professional standards, is to form and express an opinion about whether the financial statements that have been prepared by management with your oversight are presented fairly, in all material respects, in accordance with accounting principles generally accepted in the United States of America. Our audit of the financial statements does not relieve you or management of your respective responsibilities.

Our responsibility, as prescribed by professional standards, is to plan and perform our audit to obtain reasonable, rather than absolute, assurance about whether the financial statements are free of material misstatement. An audit of financial statements includes consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control over financial reporting. Accordingly, as part of our audit, we considered the internal control of the Program solely for the purpose of determining our audit procedures and not to provide any assurance concerning such internal control.

We are also responsible for communicating significant matters related to the audit that are, in our professional judgment, relevant to your responsibilities in overseeing the financial reporting process. However, we are not required to design procedures for the purpose of identifying other matters to communicate to you.

We have provided our findings regarding significant control deficiencies over financial reporting and material noncompliance, and other matters noted during our audit in a separate letter to you dated March 21, 2024.

Planned Scope and Timing of the Audit

We conducted our audit consistent with the planned scope and timing we previously communicated to you.

Compliance with All Ethics Requirements Regarding Independence

The engagement team, others in our firm, as appropriate, our firm, and other firms utilized in the engagement, if applicable, have complied with all relevant ethical requirements regarding independence.

Qualitative Aspects of the Entity's Significant Accounting Practices*Significant Accounting Policies*

Management has the responsibility to select and use appropriate accounting policies. A summary of the significant accounting policies adopted by the Program is included in Note 1 to the financial statements. There have been no initial selection of accounting policies and no changes in significant accounting policies or their application during 2023. No matters have come to our attention that would require us, under professional standards, to inform you about (1) the methods used to account for significant unusual transactions and (2) the effect of significant accounting policies in controversial or emerging areas for which there is a lack of authoritative guidance or consensus.

Significant Accounting Estimates

Accounting estimates are an integral part of the financial statements prepared by management and are based on management's current judgments. Those judgments are normally based on knowledge and experience about past and current events and assumptions about future events. Certain accounting estimates are particularly sensitive because of their significance to the financial statements and because of the possibility that future events affecting them may differ markedly from management's current judgments. The most sensitive accounting estimate affecting the financial statements are:

- Management's estimate of the Allowance for Credit Losses is based on management's periodic review of the collectability of the loans in light of historical experience, the nature and volume of the loan portfolio, adverse situations that may affect the borrower's ability to repay, estimated value of any underlying collateral and prevailing economic conditions. This evaluation is inherently subjective as it requires estimates that are susceptible to significant revision as more information becomes available. We evaluated the key factors and assumptions used to develop the allowance for credit losses in determining that it is reasonable in relation to the financial statements taken as a whole.
- Management's estimate of Claims Payable is based on management's evaluation of delinquent loan pools reduced by estimated loan recalls. We evaluated the key factors and assumptions used to develop the estimate in determining that it is reasonable in relation to the financial statements taken as a whole.

Financial Statement Disclosures

Certain financial statement disclosures involve significant judgment and are particularly sensitive because of their significance to financial statement users. The most sensitive disclosure affecting the Program's financial statements relates to Note 4 – Allowance for Future Credit Losses.

Significant Difficulties Encountered during the Audit

We encountered no significant difficulties in dealing with management relating to the performance of the audit.

Uncorrected and Corrected Misstatements

For purposes of this communication, professional standards require us to accumulate all known and likely misstatements identified during the audit, other than those that we believe are trivial, and communicate them to the appropriate level of management. Further, professional standards require us to also communicate the effect of uncorrected misstatements related to prior periods on the relevant classes of transactions, account balances or disclosures, and the financial statements as a whole. Uncorrected misstatements or matters underlying those uncorrected misstatements could potentially cause future-period financial statements to be materially misstated, even though the uncorrected misstatements are immaterial to the financial statements currently under audit. There were no uncorrected or corrected misstatements identified as a result of our audit procedures.

Disagreements with Management

For purposes of this letter, professional standards define a disagreement with management as a matter, whether or not resolved to our satisfaction, concerning a financial accounting, reporting, or auditing matter, which could be significant to the Program's financial statements or the auditor's report. No such disagreements arose during the course of the audit.

Circumstances that Affect the Form and Content of the Auditor's Report

For purposes of this letter, professional standards require that we communicate any circumstances that affect the form and content of our auditor's report.

We have made the following modification to our auditor's report to add an Emphasis of Matter paragraph.

As discussed in Note 1, the financial statements of the Program are intended to present the financial position, changes in financial position and cash flows of only that portion of the State of North Dakota that is attributable to the transactions of the Program. They do not purport to, and do not, present fairly the financial position of the State of North Dakota as of December 31, 2023 and 2022, and the changes in its financial position for the years then ended in conformity with accounting principles generally accepted in the United States of America. Our opinion is not modified with respect to this matter.

Representations Requested from Management

We have requested certain written representations from management which are included in the management representation letter dated March 21, 2024.

Management's Consultations with Other Accountants

In some cases, management may decide to consult with other accountants about auditing and accounting matters. Management informed us that, and to our knowledge, there were no consultations with other accountants regarding auditing and accounting matters.

Other Significant Matters, Findings, or Issues

In the normal course of our professional association with the Program, we generally discuss a variety of matters, including the application of accounting principles and auditing standards, significant events or transactions that occurred during the year, operating and regulatory conditions affecting the entity, and operational plans and strategies that may affect the risks of material misstatement. None of the matters discussed resulted in a condition to our retention as the Program's auditors.

This report is intended solely for the information and use of the Governor of North Dakota, Legislative Assembly, North Dakota Industrial Commission, Bank of North Dakota Advisory Board and management of the Program and is not intended to be and should not be used by anyone other than these specified parties.

Eide Bailly LLP

Bismarck, North Dakota



February 7, 2024

Governor of North Dakota and
the Legislative Assembly
Office of the State Auditor
State of North Dakota
Advisory Board of the Bank of North Dakota
Bismarck, North Dakota

We have audited the financial statements, prepared following the Financial Accounting Standards Board (FASB) accounting standards, of the Bank of North Dakota (the Bank) as of and for the year ended December 31, 2023, and have issued our report thereon dated February 7, 2024. Professional standards require that we advise you of the following matters relating to our audit.

Our Responsibility in Relation to the Financial Statement Audit

As communicated in our letter dated October 23, 2023, our responsibility, as described by professional standards, is to form and express an opinion about whether the financial statements that have been prepared by management with your oversight are presented fairly, in all material respects, in accordance with accounting principles generally accepted in the United States of America. Our audit of the financial statements does not relieve you or management of its respective responsibilities.

Our responsibility, as prescribed by professional standards, is to plan and perform our audit to obtain reasonable, rather than absolute, assurance about whether the financial statements are free of material misstatement. An audit of financial statements includes consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control over financial reporting. Accordingly, as part of our audit, we considered the internal control of the Bank solely for the purpose of determining our audit procedures and not to provide any assurance concerning such internal control.

We are also responsible for communicating significant matters related to the audit that are, in our professional judgment, relevant to your responsibilities in overseeing the financial reporting process. However, we are not required to design procedures for the purpose of identifying other matters to communicate to you.

Planned Scope and Timing of the Audit

We conducted our audit consistent with the planned scope and timing we previously communicated to you.

Compliance with All Ethics Requirements Regarding Independence

The engagement team, others in our firm, as appropriate, our firm, and other firms utilized in the engagement, if applicable, have complied with all relevant ethical requirements regarding independence.

Significant Risks Identified

As stated in our auditor's report, professional standards require us to design our audit to provide reasonable assurance that the financial statements are free of material misstatement whether caused by fraud or error. In designing our audit procedures, professional standards require us to evaluate the financial statements and assess the risk that a material misstatement could occur. Areas that are potentially more susceptible to misstatements, and thereby require special audit considerations, are designated as "significant risks." We have identified the following as significant risks:

- Management override of internal control – management override of controls is considered to be a presumed audit risk.
- Valuation of allowance for credit losses – the allowance for credit losses is considered to be a significant estimate.
- Student loan accounting software – role based permissions related to the UAS student loan accounting software is not present.

Qualitative Aspects of the Entity's Significant Accounting Practices

Significant Accounting Policies

Management has the responsibility to select and use appropriate accounting policies. A summary of the significant accounting policies adopted by the Bank is included in Note 1 to the financial statements. As discussed in Note 1 to the financial statements, the Bank adopted the provisions of FASB Accounting Standards Update 2016-13, *Financial Instruments – Credit Losses (Topic 326): Measurements of Credit Losses on Financial Instruments*, using the modified retrospective approach. No matters have come to our attention that would require us, under professional standards, to inform you about (1) the methods used to account for significant unusual transactions and (2) the effect of significant accounting policies in controversial or emerging areas for which there is a lack of authoritative guidance or consensus.

Accounting Estimates and Related Disclosures

Accounting estimates are an integral part of the financial statements prepared by management and are based on management's current judgments. Those judgments are normally based on knowledge and experience about past and current events and assumptions about future events. Certain accounting estimates are particularly sensitive because of their significance to the financial statements and because of the possibility that future events affecting them may differ markedly from management's current judgments.

The most sensitive accounting estimate affecting the financial statements is the allowance for credit losses.

Management's estimate of the allowance for credit losses is based on management's periodic review of the collectability of the loans in light of historical experience, the nature and volume of the loan portfolio, adverse situations that may affect the borrower's ability to repay, estimated value of any underlying collateral and prevailing economic conditions. This evaluation is inherently subjective as it requires estimates that are susceptible to significant revision as more information becomes available. We evaluated the key factors and assumptions used to develop the allowance for credit losses in determining that it is reasonable in relation to the financial statements taken as a whole.

Financial Statement Disclosures

Certain financial statement disclosures involve significant judgment and are particularly sensitive because of their significance to financial statement users. The most sensitive disclosures affecting the Bank's financial statements relate to Note 4 – Loans.

Significant Difficulties Encountered during the Audit

We encountered no significant difficulties in dealing with management relating to the performance of the audit.

Uncorrected and Corrected Misstatements

For purposes of this communication, professional standards require us to accumulate all known and likely misstatements identified during the audit, other than those that we believe are trivial, and communicate them to the appropriate level of management. Further, professional standards require us to also communicate the effect of uncorrected misstatements related to prior periods on the relevant classes of transactions, account balances or disclosures, and the financial statements as a whole. Uncorrected misstatements or matters underlying those uncorrected misstatements could potentially cause future-period financial statements to be materially misstated, even though the uncorrected misstatements are immaterial to the financial statements currently under audit. There were no uncorrected or corrected misstatements identified as a result of our audit procedures.

Disagreements with Management

For purposes of this letter, professional standards define a disagreement with management as a matter, whether or not resolved to our satisfaction, concerning a financial accounting, reporting, or auditing matter, which could be significant to the financial statements or the auditor's report. No such disagreements arose during the course of the audit.

Circumstances that Affect the Form and Content of the Auditor's Report

For purposes of this letter, professional standards require that we communicate any circumstances that affect the form and content of our auditor's report.

The Bank is a governmental entity as defined by the Governmental Accounting Standards Board (GASB). As a result, the standards promulgated by GASB are the appropriate accounting standards for the Bank. However, the Bank's financial statements are presented in accordance with accounting standards promulgated by FASB even though the Bank meets the "governmental" criteria. The effects on the financial statements of the variance between the accounting policies, although not reasonably determinable, are presumed to be material.

As a result, the Bank's financial statements do not present fairly, in accordance with accounting principles generally accepted in the United States of America for governmental entities, the financial position of the Bank as of December 31, 2023 and 2022, or changes in financial position or cash flows thereof for the years then ended.

As described in Note 1 to the consolidated financial statements, the Bank adopted the provisions of ASU 2016-13, *Financial Instruments – Credit Losses (Topic 326): Measurements of Credit Losses on Financial Instruments*. We have included an emphasis of matter paragraph in our auditor's report regarding the adoption. The purpose of the paragraph is to draw attention to the disclosures for the adoption of the standards update. We did not modify our opinion related to this matter.

Representations Requested from Management

We have requested certain written representations from management that are included in the management representation letter dated February 7, 2024.

Management's Consultations with Other Accountants

In some cases, management may decide to consult with other accountants about auditing and accounting matters. Management informed us that, and to our knowledge, there were no consultations with other accountants regarding auditing and accounting matters.

Matters Resulting in Consultation outside the Engagement Team

The following significant and relevant matters resulted in consultations outside of our engagement team:

Eide Bailly LLP's quality controls procedures require consultation outside of the engagement team with a member of the Firm's National Assurance Office when modifications of the Independent Auditor's Report occur. A modification of the Independent Auditor's Report resulted from the presentation of the Bank's financials following the FASB accounting standards. As a result, the engagement team consulted with the Firm's National Assurance Office regarding the form and content of the Independent Auditor's Report.

Other Significant Matters, Findings, or Issues

In the normal course of our professional association with the Bank, we generally discuss a variety of matters, including the application of accounting principles and auditing standards, significant events or transactions that occurred during the year, business conditions affecting the entity, and business plans and strategies that may affect the risks of material misstatement. None of the matters discussed resulted in a condition to our retention as the Bank's auditors.

This report is intended solely for the information and use of the Governor of North Dakota, Legislative Assembly, Industrial Commission, Office of the State Auditor, Advisory Board of the Bank of North Dakota, and management of the Bank and is not intended to be, and should not be, used by anyone other than these specified parties.

Eide Bailly LLP

Bismarck, North Dakota

**FINANCIAL STATEMENTS
DECEMBER 31, 2023 AND 2022**



BANK OF NORTH DAKOTA
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Independent Auditor's Report

Governor of North Dakota and
the Legislative Assembly
State of North Dakota
Bismarck, North Dakota

Report on the Audit of the Financial Statements

Opinion

We have audited the financial statements of the Bank of North Dakota, which comprise the balance sheets as of December 31, 2023 and 2022, and the related statements of income, comprehensive income, equity, and cash flows for the years then ended, and the related notes to the financial statements.

Unmodified Opinion on Financial Accounting Standards Board (FASB) Basis of Accounting

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of Bank of North Dakota as of December 31, 2023 and 2022, and the results of its operations and its cash flows for years then ended, in accordance with financial reporting provisions as promulgated by FASB described in Note 1.

Adverse Opinion U.S. Generally Accepted Accounting Principles

In our opinion, because of the significance of the matter discussed in the Basis for Adverse Opinion on U.S. Generally Accepted Accounting Principles section of our report, the financial statements do not present fairly, in accordance with accounting principles generally accepted in the United States of America, the financial position of the Bank of North Dakota as of December 31, 2023 and 2022, or the results of its operations or its cash flows for the years then ended.

Basis for Opinion

We conducted our audits in accordance with auditing standards generally accepted in the United States of America (GAAS). Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the Bank of North Dakota, and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audits. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Basis for Adverse Opinion on U.S. Generally Accepted Accounting Principles

As described in Note 1 of the financial statements, Bank of North Dakota is a governmental entity as defined by the Governmental Accounting Standards Board (GASB). Accordingly, the standards as promulgated by GASB are the appropriate accounting standards for Bank of North Dakota to follow. However, Bank of North Dakota has prepared its financial statements in accordance with accounting standards as promulgated by FASB even though the entity meets the “governmental” criteria. The effects on the financial statements of the variances between the accounting policies described in Note 1 and generally accepted accounting principles for governmental entities, although not reasonably determinable, are presumed to be material.

Change in Accounting Principle

As discussed in Note 1 to the financial statements, the Bank of North Dakota adopted the provisions of FASB Accounting Standards Update 2016-13, *Financial Instruments – Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*, as of January 1, 2023, using the modified retrospective approach with an adjustment at the beginning of the adoption period. Our opinion is not modified with respect to this matter.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the Bank of North Dakota’s ability to continue as a going concern for one year after the date that the financial statements are available to be issued.

Auditor’s Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor’s report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with GAAS, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Bank of North Dakota's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the Bank of North Dakota's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Eide Bailly LLP

Bismarck, North Dakota
February 7, 2024

BANK OF NORTH DAKOTA
BALANCE SHEETS
YEARS ENDED DECEMBER 31, 2023 AND 2022
(In Thousands)

	<u>2023</u>	<u>2022</u>
ASSETS		
Cash and due from banks	\$ 402,587	\$ 405,718
Federal funds sold	37,470	44,605
	<u>440,057</u>	<u>450,323</u>
Cash and cash equivalents		450,323
Debt securities		
Available-for-sale debt securities, at fair value (amortized cost 2023 - \$4,004,801, 2022 - \$4,547,885, net of allowance for credit losses 2023 - \$0, 2022 - \$0)	3,869,666	4,307,352
Loans held for investment	5,758,740	5,364,627
Less allowance for credit losses	(99,865)	(108,752)
	<u>5,658,875</u>	<u>5,255,875</u>
Interest receivable	72,954	60,392
Bank premises, equipment, and software, net	9,149	9,311
Other restricted stock, at cost	7,243	37,000
Other assets	86,684	75,562
	<u>86,684</u>	<u>75,562</u>
Total assets	<u>\$10,144,628</u>	<u>\$ 10,195,815</u>
LIABILITIES AND EQUITY		
Deposits		
Non-interest bearing	\$ 664,010	\$ 632,498
Interest bearing	8,045,138	7,679,449
	<u>8,709,148</u>	<u>8,311,947</u>
Federal funds purchased	323,010	205,845
Short and long-term debt	25,000	675,000
Other liabilities	28,183	5,835
	<u>28,183</u>	<u>5,835</u>
Total liabilities	<u>9,085,341</u>	<u>9,198,627</u>
Equity		
Capital	2,000	2,000
Capital surplus	72,000	72,000
Undivided profits	1,068,297	1,100,653
Accumulated other comprehensive loss	(83,010)	(177,465)
	<u>1,059,287</u>	<u>997,188</u>
Total equity	<u>1,059,287</u>	<u>997,188</u>
Total liabilities and equity	<u>\$10,144,628</u>	<u>\$ 10,195,815</u>

See Notes to Financial Statements

BANK OF NORTH DAKOTA
STATEMENTS OF INCOME
YEARS ENDED DECEMBER 31, 2023 AND 2022
(In Thousands)

	<u>2023</u>	<u>2022</u>
INTEREST INCOME		
Loans, including fees	\$ 262,165	\$ 186,158
Securities	100,335	73,873
Federal funds sold	2,713	560
Total interest income	<u>365,213</u>	<u>260,591</u>
INTEREST EXPENSE		
Deposits	100,255	29,241
Federal funds purchased and repurchase agreements	13,678	5,649
Short and long-term debt	23,268	5,992
Total interest expense	<u>137,201</u>	<u>40,882</u>
NET INTEREST INCOME	228,012	219,709
PROVISION FOR CREDIT LOSSES	<u>7,507</u>	<u>-</u>
NET INTEREST INCOME AFTER PROVISION FOR CREDIT LOSSES	<u>220,505</u>	<u>219,709</u>
NONINTEREST INCOME		
Service fees and other	<u>6,697</u>	<u>4,751</u>
Total noninterest income	<u>6,697</u>	<u>4,751</u>
NONINTEREST EXPENSE		
Salaries and benefits	19,564	17,547
Data processing	7,466	7,354
Long-term debt prepayment fee	-	1,171
Occupancy and equipment	828	752
Other operating expenses	6,605	6,486
Total noninterest expenses	<u>34,463</u>	<u>33,310</u>
NET INCOME	<u>\$ 192,739</u>	<u>\$ 191,150</u>

See Notes to Financial Statements

BANK OF NORTH DAKOTA
STATEMENTS OF COMPREHENSIVE INCOME
YEARS ENDED DECEMBER 31, 2023 AND 2022
(In Thousands)

	<u>2023</u>	<u>2022</u>
Net income	<u>\$ 192,739</u>	<u>\$ 191,150</u>
Other comprehensive income (loss)		
Unrealized gain (loss) on available-for-sale debt securities	<u>105,398</u>	<u>(242,653)</u>
Cash flow hedging activities -interest rate swap contracts	<u>(10,943)</u>	<u>97,519</u>
Other comprehensive income (loss)	<u>94,455</u>	<u>(145,134)</u>
Comprehensive income	<u>\$ 287,194</u>	<u>\$ 46,016</u>

BANK OF NORTH DAKOTA
STATEMENTS OF EQUITY
YEARS ENDED DECEMBER 31, 2023 AND 2022
(In Thousands)

	Capital	Capital Surplus	Undivided Profits	Accumulated Other Comprehensive Income (Loss)	Total
BALANCE, DECEMBER 31, 2021	\$ 2,000	\$ 72,000	\$ 939,900	\$ (32,331)	\$ 981,569
Net income			191,150		191,150
Unrealized loss on available-for-sale debt securities				(242,653)	(242,653)
Unrealized gain on interest rate swaps				97,519	97,519
Appropriations In		305,500			305,500
Appropriations (Out)		(305,500)			(305,500)
Transfers to other state funds			(30,397)		(30,397)
BALANCE, DECEMBER 31, 2022	2,000	72,000	1,100,653	(177,465)	997,188
Cumulative change in accounting principal					
Net income			3,143		3,143
Unrealized gain on available-for-sale debt securities			192,739		192,739
Unrealized loss on interest rate swaps				105,398	105,398
Appropriations In		5,500		(10,943)	(10,943)
Appropriations (Out)		(5,500)			5,500
Transfers to other state funds			(228,238)		(228,238)
BALANCE, DECEMBER 31, 2023	\$ 2,000	\$ 72,000	\$ 1,068,297	\$ (83,010)	\$ 1,059,287

See Notes to Financial Statements

BANK OF NORTH DAKOTA
STATEMENTS OF CASH FLOWS
YEARS ENDED DECEMBER 31, 2023 AND 2022
(In Thousands)

	<u>2023</u>	<u>2022</u>
OPERATING ACTIVITIES		
Net income	\$ 192,739	\$ 191,150
Adjustments to reconcile net income to net cash from (used for) operating activities		
Depreciation and amortization	547	379
Provision for credit losses	7,507	-
Amortization of debt securities	13,785	20,121
Loss on sale of foreclosed assets	1	1,742
Net change in interest receivable	(12,562)	(14,223)
Net change in other assets	(22,091)	(1,075)
Net change in other liabilities	9,501	201
NET CASH FROM OPERATING ACTIVITIES	<u>189,427</u>	<u>198,295</u>
INVESTING ACTIVITIES		
Debt securities available for sale transactions		
Purchases of available-for-sale debt securities	(298,914)	(2,627,516)
Proceeds from sales, maturities, and repayments of available for sale securities	828,213	643,784
Purchase of Federal Home Loan Bank stock	(445,000)	(151,707)
Proceeds from sales, maturities, and repayments of Federal Home Loan Bank stock	474,757	128,320
Loan principal collections (originations) net	(394,616)	(675,775)
Purchases of premises, equipment, and software	(385)	(456)
Payments from rebuilders loan program	-	2,149
Proceeds from sale of foreclosed assets	124	2,946
NET CASH FROM (USED FOR) INVESTING ACTIVITIES	<u>164,179</u>	<u>(2,678,255)</u>
FINANCING ACTIVITIES		
Net change in non-interest bearing deposits	31,512	(132,702)
Net change in interest bearing deposits	365,689	310,755
Net change in federal funds purchased	117,165	(557,405)
Proceeds from issuance of short and long-term debt	13,300,001	3,775,001
Repayment of short and long-term debt	(13,950,001)	(3,208,001)
Payment of transfers to other state funds	(228,238)	(30,397)
NET CASH (USED FOR) FROM FINANCING ACTIVITIES	<u>(363,872)</u>	<u>157,251</u>
NET CHANGE IN CASH AND CASH EQUIVALENTS	<u>(10,266)</u>	<u>(2,322,709)</u>
CASH AND CASH EQUIVALENTS, BEGINNING OF YEAR	<u>450,323</u>	<u>2,773,032</u>
CASH AND CASH EQUIVALENTS, END OF YEAR	<u><u>\$ 440,057</u></u>	<u><u>\$ 450,323</u></u>

BANK OF NORTH DAKOTA
NOTES TO FINANCIAL STATEMENTS
DECEMBER 31, 2023 AND 2022
(In Thousands)

NOTE 1 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Nature of Operations

Bank of North Dakota (BND) is owned and operated by the State of North Dakota under the supervision of the Industrial Commission as provided by Chapter 6-09 of the North Dakota Century Code. BND is a unique institution combining elements of banking, fiduciary, investment management services, and other financial services, and state government with a primary role in financing economic development. BND is a participation lender; the vast majority of its loans are purchased from financial institutions throughout the State of North Dakota. BND's primary deposit products are interest-bearing accounts for state and political subdivisions. Deposits held at the Bank are not covered by depository insurance, but rather are guaranteed by the State of North Dakota as described in NDCC Section 6-09-10.

Bank of North Dakota is included as part of the primary government in the State of North Dakota's reporting entity. As such, BND is required to follow the pronouncements of the Government Accounting Standards Board (GASB), which is the nationally accepted standard setting body for establishing generally accepted accounting principles for governmental entities.

However, the accompanying financial statements are prepared in accordance with Financial Accounting Standards Board Accounting Standards Codification, which are generally accepted accounting principles for financial institutions.

BND also prepares financial statements in accordance with GASB pronouncements.

Use of Estimates

In preparing financial statements in conformity with generally accepted accounting principles, management is required to make estimates and assumptions that affect the reported amounts of assets and liabilities as of the date of the balance sheet and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates. Material estimates that are particularly susceptible to significant change in the near-term relate to the determinations of the allowance for credit losses and the fair market value of interest rate swaps.

Significant Group Concentrations of Credit Risk

Most of the Bank's lending activities are with customers within the State of North Dakota. The Bank's loan portfolio is comprised of the following concentrations as of December 31, 2023 and 2022:

	<u>2023</u>	<u>2022</u>
Commercial loans, of which 2% and 2% are federally guaranteed	63%	60%
Student loans, of which 100% and 100% are guaranteed	19%	20%
Residential loans, of which 70% and 67% are federally guaranteed	5%	7%
Agricultural loans, of which 4% and 5% are federally guaranteed	13%	13%
	<u>100%</u>	<u>100%</u>

Continued on next page

BANK OF NORTH DAKOTA
NOTES TO FINANCIAL STATEMENTS
DECEMBER 31, 2023 AND 2022
(In Thousands)

Cash and Cash Equivalents

For purposes of the statements of cash flows, cash and cash equivalents include cash and balances due from banks and federal funds sold, all with original maturities of 90 days or less.

Securities

Debt securities that may be sold before maturity in response to changes in interest rates or prepayment risk, or due to liquidity needs or changes in funding sources or terms are classified as available-for-sale. These securities are recorded at fair value, with unrealized gains and losses excluded from earnings and reported in comprehensive income (loss). Debt securities that management has the positive intent and ability to hold to maturity are classified as held to maturity and recorded at amortized cost.

Purchase premiums and discounts are recognized in interest income using the interest method over the terms of the securities, which for premiums is the earlier of maturity or call date. Gains and losses on the sale of securities are recorded on the trade date and are determined using the specific identification method.

Allowance for Credit Losses – Available-for-Sale Securities

The Bank measures the allowance for credit losses on available for sale debt securities by first assessing whether it intends to sell, or it is more likely than not that it will be required to sell the security before recovery of its amortized cost. If it is determined that the Bank intends or will be required to sell the security, it is written down to its fair value through income. For securities issued by government agencies that do not meet the aforementioned criteria, there are no expected credit losses as they are guaranteed by the U.S. government, are highly rated by major rating agencies, and have a long history of no credit losses. For other debt securities that do not meet the aforementioned criteria, the Bank evaluates whether the decline in fair value has resulted from credit losses or other factors. In making this assessment management considers the extent to which fair value is less than amortized cost, any changes to the rating of the security by a rating agency, and adverse conditions specifically related to the security, among other factors. If this assessment indicates that a credit loss exists, the present value of cash flows expected to be collected from the security are compared to the amortized cost of the security. If the present value of cash flows expected to be collected is less than the amortized cost basis, a credit loss exists and an allowance for credit losses on available-for-sale investments is recorded and is limited to the amount that the fair value is less than the amortized cost basis. Any impairment that has not been recorded through an allowance for credit losses is recognized in other comprehensive income (loss).

Changes in the allowance for credit losses are recorded as provision for or (reversal) of credit losses. Losses are charged against the allowance when management believes the uncollectability of an available-for-sale debt security is confirmed or when the criteria regarding intent or requirement to sell is met.

Accrued interest receivable on available-for-sale debt securities totaling \$12,440 and \$12,685 at December 31, 2023 and 2022, respectively, is included in interest receivable on the consolidated balance sheets and is excluded from the estimate of credit losses.

BANK OF NORTH DAKOTA
NOTES TO FINANCIAL STATEMENTS
DECEMBER 31, 2023 AND 2022
(In Thousands)

Other Restricted Stock

The Bank is a member of the Federal Home Loan Bank (FHLB) system. Members are required to own a certain amount of stock based on the level of borrowings and other factors and may invest additional amounts. FHLB stock is carried at cost, classified as a restricted security, and periodically evaluated for impairment based on ultimate recovery of par value. Both cash and stock dividends are reported as income.

The amount of stock that the Bank must hold is equal to .12% of total bank assets plus 4% of total FHLB advances. Since ownership of this stock is restricted, these securities are carried at cost and evaluated periodically for impairment. Effective December 15, 2023, the amount of stock that the Bank must hold is equal to .06% of total bank assets plus 4.50% of total FHLB advances.

Fair Value of Financial Instruments

Fair values of financial instruments are estimated using relevant market information and other assumptions, as more fully disclosed in a separate footnote. Fair value estimates involve uncertainties and matters of significant judgement regarding interest rates, credit risk, prepayments, and other factors, especially in the absence of broad markets for particular items. Changes in assumptions or in market conditions could significantly affect these estimates.

Loans

Loans are reported at the outstanding unpaid principal balances, adjusted for charge-offs, unamortized deferred fees and costs on originated loans and premiums or discounts on purchased loans. Interest income on loans is accrued at the specific rate on the unpaid principal balance. Unearned income, deferred fees and costs, and discounts and premiums are amortized to income over the estimated life of the loan using the interest or straight line method.

Interest income on loans is accrued at the specific rate on the unpaid principal balance. The accrual of interest is discontinued at the time the loan is 90 days delinquent unless the credit is well secured and in the process of collection or when, in management's opinion, the borrower may be unable to meet payments as they become due. Past due status is based on contractual terms of the loan. In all cases, loans are placed on non-accrual or charged-off at an earlier date if collection of principal or interest is considered doubtful.

All interest accrued but not collected for loans that are placed on non-accrual or charged-off is reversed against interest income. The interest on these loans is accounted for on the cash-basis or cost-recovery method, until qualifying for return to accrual. Loans are returned to accrual status when all the principal and interest amounts contractually due are brought current and future payments are reasonably assured.

Accrued interest receivable on loans totaling \$58,776 and \$46,613 at December 31, 2023 and 2022, respectively, is included in interest receivable on the consolidated balance sheets and is excluded from the estimate of credit losses.

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Commercial loans are primarily made for business working capital needs and are underwritten based on the identified or projected cash flows of the borrower and/or the underlying collateral provided by the borrower. The primary repayment risks of C&I loans are that the cash flows of the borrower may be unpredictable, and the collateral securing these loans may fluctuate in value. Collateral for these loans generally includes the business assets financed, accounts receivable, inventory, and equipment. The collateral securing these loans may depreciate over time, may be difficult to appraise, and may fluctuate in value based on the success of the business. These loans may incorporate a corporate or personal guarantee.

Commercial real estate loans are offered to commercial customers for the acquisition of real estate used in their businesses, such as offices, warehouses and production facilities, and to real estate investors for the acquisition of apartment buildings, retail centers, office buildings and other commercial buildings. Commercial real estate loans are underwritten after evaluating and understanding the borrower's ability to operate profitably and prudently expand its business. Management examines current and projected cash flows to determine the ability of the borrower to repay its obligations as agreed. Commercial real estate lending typically involves higher loan principal amounts and the repayment of these loans is generally dependent on sufficient income from the properties securing the loans to cover operating expenses and debt service. Commercial real estate loans may be more adversely affected by conditions in the real estate markets or in the general economy.

Agricultural operating loans are generally comprised of loans to fund farm operations and the purchase of equipment and livestock. Operating lines are typically written for one year and secured by the crop and other farm assets or business assets, as considered appropriate. Repayment of agricultural loans depends on the successful operation or management of the farm property securing the loan or for which an operating loan is utilized. The ability of the borrower to repay may be affected by many factors outside of the borrower's control including adverse weather conditions, loss of livestock due to disease or other factors, declines in market prices for agricultural products and the impact of government regulations.

Agricultural real estate loans are primarily comprised of real estate operated and owned or leased by a farmer, or other organization authorized to own, or lease land used for farming or ranching. The Bank may make direct loans through Beginning Farmer and Established Farmer for the purchase of farm real estate. The Bank may also participate in loans for the purchase of farm real estate through other agricultural programs.

Residential real estate loans are collateralized by primary and secondary positions on 1-4 family real estate and are underwritten primarily based on borrower's documented income, credit scores, and collateral values. Repayment of these loans is largely dependent on the borrower's financial stability and may be impacted by adverse personal circumstances. Credit risk is minimized within the residential mortgage portfolio due to relatively smaller loan balances spread across many individual borrowers. The Bank no longer originates residential mortgage loans. In December 2020, the Bank signed a Servicing Agreement with the North Dakota Housing Finance Agency (NDHFA) effective April 1, 2021, to transfer the Bank's mortgage servicing to NDHFA.

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Student loans are offered to North Dakota residents and non-residents to attend both in-state and out-of-state colleges. Dakota Education Alternative Loans (DEAL) are fully guaranteed by the North Dakota Guaranteed Student Loan Program, which is administered by the Bank. DEAL Student Loans are offered to assist in covering the cost of attending college if federal loans, grants, scholarships and savings don't meet funding needs. It can be used for undergraduate and graduate classes. In addition, refinancing options are available to combine loans from one or more lenders into one new loan, with the option for extended repayment terms. As of April 1, 2024, BND will only offer student loans to North Dakota residents attending an eligible in-state and out-of-state school, and out-of-state residents attending a North Dakota school.

Allowance for Credit Losses (ACL) - Loans

The ACL for loans is a valuation allowance for the current expected credit losses in the Bank's loan portfolio that is deducted from the loan's amortized cost basis to present the net amount expected to be collected. Loans are charged-off against the allowance when management believes the collectability of the loan balance is unlikely. Subsequent recoveries, if any, are credited to the ACL. Prior to January 1, 2023, the valuation allowance (Allowance for Loan Losses) was established for probable and inherent credit losses.

Management estimates the allowance over the loan's entire contractual term, adjusted for expected prepayments when appropriate. The allowance estimate considers relevant, available information from internal and external sources relating to past events, current conditions, and reasonable and supportable forecasts. Historical credit loss experience provides the basis for the estimation of expected credit losses. Adjustments to historical loss information are made for qualitative or environmental factors that cause the estimate for expected losses as of the evaluation date to differ from historical loss experience. Qualitative factors include consideration of the following: changes in lending policies and procedures; changes in economic conditions, changes in the nature and volume of the portfolio; changes in the experience, ability and depth of lending management and other relevant staff; changes in the volume and severity of past due, nonaccrual and other adversely graded loans; changes in the loan review system; changes in the collateral valuations; concentrations of credit; the effect of other external factors such as competition and legal and regulatory requirements; and other relevant factors determined by management.

The ACL is measured on a collective (pool) basis when similar risk characteristics exist and on an individual basis when management determines that the loan does not share similar risk characteristics with other loans. The Bank has identified the following loan pools: commercial, agricultural, residential, and student loans. Relevant risk characteristics for commercial, agricultural, residential, and student loan pools include debt service coverage, loan-to-value ratios and financial performance. Relevant risk characteristics for commercial, agricultural, residential, and student loan pools include credit scores, debt-to income ratios, collateral type and loan-to-value ratios. The Bank uses the Weighted Average Remaining Maturity method to measure the ACL for all loan pools to calculate a loss rate that combines the pool's risk characteristics, historical loss experience, and reasonable and supportable future economic forecasts to project lifetime losses. The loss rate is then combined with the loans balance and contractual maturity, adjusted for expected prepayments, to determine expected future losses. Future and supportable economic forecasts are based on various economic conditions over a period of up to 72 months followed by a reversion back to historical losses.

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Loans that do not share similar risk characteristics to their loan pool are evaluated on an individual basis and are excluded from the collective measurement. Loans can be identified for individual evaluation for various reasons including delinquency, nonaccrual status, risk rating and loan modifications. A loan is considered collateral dependent when management determines that foreclosure is probable or when the borrower is experiencing financial difficulty and repayment is expected to be provided substantially through the operation or sale of the collateral. The ACL on collateral dependent loans is measured using the amortized cost basis of the financial asset less the fair value of the underlying collateral, adjusted for costs to sell, when applicable. If the value of the underlying collateral is determined to be less than the recorded amount of the loan, a specific reserve for that loan is recorded. If the Bank determines that the loss represented by the specific reserve is uncollectible it records a charge-off for the uncollectible portion.

Allowance for Credit Losses (ACL) – Unfunded Commitments

The Bank establishes a liability for estimated expected credit losses on unfunded commitments to originate or fund loans and standby letters of credit, excluding commitments that are unconditionally cancellable. The estimate is included in “Other Liabilities” on the balance sheets. Expected credit losses are estimated over the contractual period in which the Bank is exposed to credit risk through the commitment adjusted for anticipated prepayments when appropriate. The estimate of the liability also considers the likelihood that funding will occur. The ACL on unfunded commitments is adjusted through provision for credit losses on statements of income. The underwriting process and risks associated with unfunded commitments and standby letters of credit are essentially the same as loans and therefore the Bank uses the same ACL process as loans to estimate the liability.

Transfers of Financial Assets

Transfers of financial assets are accounted for as sales when control over the assets has been surrendered. Control over transferred assets is deemed to be surrendered when (1) the assets have been isolated from the Bank, (2) the transferee obtains the right (free of conditions that constrain it from taking advantage of that right) to pledge or exchange the transferred assets, and (3) the Bank does not maintain effective control over the transferred assets through an agreement to repurchase them before their maturity.

Derivatives and Hedging Activities

At the inception of a derivative contract, the Bank designates the derivative as one of three types based on the Bank’s intentions and belief as to likely effectiveness as a hedge. These three types are (1) a hedge of the fair value of a recognized asset or liability or of an unrecognized firm commitment (“fair value hedge”), (2) a hedge of a forecasted transaction or the variability of cash flows to be received or paid related to a recognized asset or liability (“cash flow hedge”), or (3) an instrument with no hedging designation (“stand-alone derivative”). For a fair value hedge, the gain or loss on the derivative, as well as the offsetting loss or gain on the hedged item, are recognized in current earnings as fair values change. For a cash flow hedge, the gain or loss on the derivative is reported in other comprehensive income and is reclassified into earnings in the same periods during which the hedged transaction affects earnings. For both types of hedges, changes in the fair value of derivatives that are not highly effective in hedging the changes in fair value or expected cash flows of the hedged item are recognized immediately in current earnings. Changes in the fair value of derivatives that do not qualify for hedge accounting are reported currently in earnings, as non-interest income.

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Net cash settlements on derivatives that qualify for hedge accounting are recorded in interest income or interest expense, based on the item being hedged. Net cash settlements on derivatives that do not qualify for hedge accounting are reported in non-interest income. Cash flows on hedges are classified in the cash flow statement the same as the cash flows of the items being hedged.

The Bank formally documents the relationship between derivatives and hedged items, as well as the risk-management objective and the strategy for undertaking hedge transactions at the inception of the hedging relationship. This documentation includes linking fair value or cash flow hedges to specific assets and liabilities on the balance sheet or to specific firm commitments or forecasted transactions. The Bank also formally assesses, both at the hedge's inception and on an ongoing basis, whether the derivative instruments that are used are highly effective in offsetting changes in fair values or cash flows of the hedged items. The Bank discontinues hedge accounting when it determines that the derivative is no longer effective in offsetting changes in the fair value or cash flows of the hedged item, the derivative is settled or terminates, a hedged forecasted transaction is no longer probable, a hedged firm commitment is no longer firm, or treatment of the derivative as a hedge is no longer appropriate or intended.

When hedge accounting is discontinued, subsequent changes in fair value of the derivative are recorded as non-interest income. When a fair value hedge is discontinued, the hedged asset or liability is no longer adjusted for changes in fair value and the existing basis adjustment is amortized or accreted over the remaining life of the asset or liability. When a cash flow hedge is discontinued but the hedged cash flows or forecasted transactions are still expected to occur, gains or losses that were accumulated in other comprehensive income into earnings over the same periods which the hedged transactions will affect earnings.

Bank Premises, Equipment, and Software

Buildings and related components are depreciated using the straight-line method with useful lives ranging from 5 to 40 years. Furniture, fixtures, software and equipment are depreciated using the straight-line or accelerated method with useful lives ranging from 3 to 10 years.

Foreclosed Assets

Foreclosed assets, which are included in other assets, represent assets acquired through loan foreclosure or other proceedings. Foreclosed assets are recorded at the lower of the amount of the loan or fair market value of the assets. Any write-down to fair market value at the time of the transfer to foreclosed assets is charged to the allowance for credit losses. Subsequent to foreclosure, valuations are periodically performed by management and the assets are carried at the lower of carrying amount or fair value less cost to sell. Revenue and expenses from operations and change in the valuation allowance are included in other operating expenses. Foreclosed assets totaled \$4,223 and \$4,249 as of December 31, 2023 and 2022, respectively.

Defined Benefit Plan

The Bank funds amounts equal to pension costs accrued.

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Income Taxes

Bank of North Dakota is a governmental agency of the State of North Dakota and, as such, is not subject to federal or state income taxes.

Comprehensive Income

Comprehensive income consists of net income and other comprehensive income. Other comprehensive income includes unrealized gains and losses on securities available for sale and unrealized gains and losses on interest rate swaps which are also recognized as separate components of equity.

Recent Accounting Guidance

On January 1, 2023, the Bank adopted Accounting Standards Update (“ASU”) 2016-13, *Financial Instruments – Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments, as amended*, which replaces the incurred loss methodology with an expected loss methodology referred to as current expected credit losses (“CECL”). The measurement of expected losses under the CECL methodology is applicable to financial assets measured at amortized cost, including loans, held-to-maturity debt securities and off-balance sheet credit exposures. In addition, Topic 326 made changes to the accounting for available-for-sale debt securities including the requirement to present credit losses as an allowance rather than a write-down on available-for-sale debt securities that management does not intend to sell or believes it is more likely than not they will be required to sell.

The Bank adopted Topic 326 using the modified retrospective method for all financial assets measured at amortized cost and off-balance-sheet credit exposures. Results for reporting periods beginning after January 1, 2023 are presented under ASC 326, while prior period amounts continue to be reported in accordance with previously applicable GAAP. The Bank recorded a net increase to undivided profits of \$3,143 as of January 1, 2023 for the cumulative effect of adopting Topic 326. The transition adjustment impact is due solely to the decrease in ACL related to loans.

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	Pre-ASU 2016-13 Adoption December 31, 2022	Impact of ASU 2016-13	As Reported Under ASU 2016-13 January 1, 2023
Assets			
Loans			
Commercial	\$ 94,886	\$ (16,387)	\$ 78,499
Agricultural	12,400	(1,119)	11,281
Residential	1,466	167	1,633
Student	-	-	-
Total allowance for credit losses on loans	\$ 108,752	\$ (17,339)	\$ 91,413
Liabilities			
Accrued expenses and other liabilities -			
Allowance for credit losses on unfunded commitments	-	14,196	14,196
Total allowance for credit losses	\$ 108,752	\$ (3,143)	\$ 105,609

ASU 2022-02, Financial Instruments-Credit Losses (Topic 326), Troubled Debt Restructurings and Vintage Disclosures - This ASU addresses and amends areas identified by the FASB as part of its post-implementation review of the accounting standard that introduced the current expected credit losses model. The amendments eliminate the accounting guidance for troubled debt restructurings by creditors that have adopted the current expected credit losses model and enhance the disclosure requirements for loan refinancings and restructurings made with borrowers experiencing financial difficulty. The company adopted ASU 2022-02 in conjunction with ASU 2016-13 on January 1, 2023 using the prospective approach.

NOTE 2 - RESTRICTION AND CONCENTRATION ON CASH AND DUE FROM BANKS

The Federal Reserve announced the reduction of the reserve requirement ratio to zero percent across all deposit tiers, effective March 26, 2020. Depository institutions that were required to maintain deposits in a Federal Reserve Bank account to satisfy reserve requirements will no longer be required to do so.

The Bank has depository relationships where it is a requirement of the other institution in order to have a business relationship. Deposits at these institutions are insured up to \$250,000 with the Federal Deposit Insurance Corporation except for deposits with the Federal Reserve Bank and the Federal Home Loan Bank. The amount of cash deposits not covered by FDIC insurance was \$42,977 and \$47,782 as of December 31, 2023 and 2022, respectively. Of these amounts, \$39,562 and 44,619 were deposited at the Federal Reserve Bank.

The Bank was appropriated up to \$680,000 through H.B. 1431 of the sixty-seventh legislative session in bond proceeds issued by the Public Finance Authority for allocations to infrastructure projects and programs, for the biennium beginning July 1, 2021, and ending June 30, 2023. As of December 31, 2022, the Bank has received and transferred to Public Finance Authority net proceeds of \$680,000.

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H.B. 1003, Section 10 of the sixty-eighth legislative session states the office of management and budget shall transfer \$5,500 from the strategic investment and improvements fund to the economic diversification research fund, the sum of which is appropriated to the Bank of North Dakota for the purpose of providing grants to institutions under the control of the state board of higher education, for the biennium beginning July 1, 2023, and ending June 30, 2025, as requested by the commissioner of higher education. As of December 31, 2023, SIFF has transferred \$5,500.

NOTE 3 - SECURITIES

The following summarizes the amortized cost, gross unrealized gain, gross unrealized losses, fair value and allowance for credit losses of available-for-sale debt securities at December 31, 2023 and 2022:

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Allowance for Credit Losses	Fair Value
DECEMBER 31, 2023					
Debt securities available for sale					
US Treasury	\$ 1,543,949	\$ -	\$ 56,691	\$ -	\$ 1,487,258
U.S. government agencies	346,250	2,213	13,373	-	335,090
States and municipalities	1,000	-	-	-	1,000
Mortgage-backed	2,113,602	10,043	77,327	-	2,046,318
	<u>\$ 4,004,801</u>	<u>\$ 12,256</u>	<u>\$ 147,391</u>	<u>\$ -</u>	<u>\$ 3,869,666</u>

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
DECEMBER 31, 2022				
Debt securities available for sale				
US Treasury	\$ 2,067,633	\$ -	\$ 112,501	\$ 1,955,132
U.S. government agencies	390,865	3,148	21,137	372,876
States and municipalities	1,000	-	-	1,000
Mortgage-backed	2,088,387	123	110,166	1,978,344
	<u>\$ 4,547,885</u>	<u>\$ 3,271</u>	<u>\$ 243,804</u>	<u>\$ 4,307,352</u>

There were \$1,501,836 and \$1,183,250 of debt securities pledged as of December 31, 2023 and 2022 for other required pledging purposes. FHLB stock totaling \$7,243 and \$37,000 as of December 31, 2023 and 2022, respectively, was pledged on the FHLB advances (Note 8).

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The amortized cost and fair value of debt securities by contractual maturity at December 31, 2023, follows:

	Available for Sale	
	Amortized Cost	Fair Value
Due in one year or less	\$ 942,697	\$ 919,737
Due in one to five years	2,833,906	2,717,509
Due from five to ten years	160,296	162,916
Due after ten years	67,902	69,504
	\$ 4,004,801	\$ 3,869,666

There were no sales of available-for-sale securities during the years ended December 31, 2023 and 2022.

The following tables shows the gross unrealized losses and fair value of the Bank's available-for-sale securities with unrealized losses for which an allowance for credit losses has not been recorded, aggregated by investment category and length of time that individual securities have been in a continuous unrealized loss position. Securities at December 31, 2023 are as follows:

	Less Than Twelve Months		Over Twelve Months		Total	
	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value
DECEMBER 31, 2023						
Debt securities available for sale						
US Treasury	\$ 3	\$ 621	\$ 56,688	\$ 1,486,638	\$ 56,691	\$ 1,487,259
U.S. government agencies	4	6,272	13,369	249,063	13,373	255,335
States and municipalities	-	-	-	-	-	-
Mortgage-backed	816	70,786	76,511	1,660,061	77,327	1,730,847
	\$ 823	\$ 77,679	\$ 146,568	\$ 3,395,762	\$ 147,391	\$ 3,473,441

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Securities at December 31, 2022 were as follows:

DECEMBER 31, 2022	Less Than Twelve Months		Over Twelve Months		Total	
	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value
Debt securities available for sale						
US Treasury	\$ 31,895	\$ 571,258	\$ 80,606	\$ 1,383,874	\$ 112,501	\$ 1,955,132
U.S. government agencies	4,867	109,316	16,270	163,856	21,137	273,172
States and municipalities	-	-	-	-	-	-
Mortgage-backed	67,469	1,508,378	42,697	447,394	110,166	1,955,772
	<u>\$ 104,231</u>	<u>\$ 2,188,952</u>	<u>\$ 139,573</u>	<u>\$ 1,995,124</u>	<u>\$ 243,804</u>	<u>\$ 4,184,076</u>

At December 31, 2023 no ACL was established for available-for-sale securities. Unrealized losses at December 31, 2023 are a result of expected fluctuations in the bond market primarily driven by changes in market interest rate.

At December 31, 2023 unrealized losses on available-for-sale securities are primarily composed of securities that are directly or implicitly guaranteed by the U.S. government and are highly rated by major rating agencies with a history of no credit losses. Timely payments of principal and interest are expected. Obligations of states and political subdivisions are of high credit quality, with a total of 100% rated AA or higher. All issuers continue to make timely principal and interest payments and financial statements are periodically reviewed as part of post-purchase analysis. The decline in value in any of these securities is deemed to be temporary and not attributable to credit losses. Furthermore, the Bank does not intend to sell, and it is likely that management will not be required to sell, these securities prior to their anticipated recovery, and the decline in fair value is largely due to changes in interest rates and other market conditions.

As of December 31, 2022, no available for sale debt securities were written down as other-than-temporary impairments. The unrealized loss position is primarily driven by changes in interest rates and not due to underlying credit losses. The Bank has evaluated and concluded that it does not intend to sell any of these securities, and that it is more likely than not that it will not be required to sell prior to recovery.

Management evaluates debt securities for other-than-temporary impairment at least on a quarterly basis, and more frequently when economic or market concerns warrant such evaluation. Consideration is given to (1) the length of time and the extent to which the fair value has been less than cost, (2) the financial condition and near-term prospects of the issuer, and (3) the intent and ability of the Bank to retain its investment in the issuer for a period of time sufficient to allow for any anticipated recovery in fair value.

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NOTE 4 - LOANS

The composition of the loan portfolio as of December 31, 2023 and 2022 is as follows:

	<u>2023</u>	<u>2022</u>
Commercial	\$ 3,644,897	\$ 3,199,277
Student	1,063,453	1,104,408
Residential	316,153	351,076
Agricultural	734,237	709,866
	<u>5,758,740</u>	<u>5,364,627</u>
Allowance for credit losses	<u>(99,865)</u>	<u>(108,752)</u>
	<u>\$ 5,658,875</u>	<u>\$ 5,255,875</u>

Unamortized deferred student loan costs totaled \$16,836 and \$20,127 as of December 31, 2023 and 2022, respectively. Net unamortized loan premiums and discounts, including purchased servicing rights, on residential loans totaled (\$28) and (\$72) as of December 31, 2023 and 2022, respectively.

In the normal course of business, overdrafts of deposit accounts are reclassified as loans. There were \$891 overdrafts of deposit accounts as of December 31, 2023. There were \$1,310 overdrafts of deposit accounts as of December 31, 2022.

For purposes of determining the allowance for credit losses, the Bank has segmented certain loans in the portfolio by product type. Loans are segmented into the following pools: commercial, agricultural, residential real estate, and student loans. The Bank also sub-segments the commercial and agricultural segments into classes based on the associated risks within those segments. Commercial loans are divided into three classes: commercial participations, bank stock, and all other business loans (including PACE). Agricultural loans are also divided into three classes: farm & ranch, farm real estate, and all other farm loans. Each class of loan exercises significant judgment to determine the estimation method that fits the credit risk characteristics of its portfolio segment.

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The following tables present the activity in the ACL by portfolio segment for the years ended December 31, 2023 and 2022:

	2023				
	Commercial	Agricultural	Residential	Student	TOTAL
Beginning Balance:	\$ 94,886	\$ 12,400	\$ 1,466	\$ -	\$ 108,752
Transfer to ACL on off-balance sheet reserve	(13,774)	(422)	-	-	(14,196)
Impact of adopting ASC 326	(2,613)	(697)	167	-	(3,143)
Charge-offs	(3,402)	-	(15)	-	(3,417)
Recoveries	3,013	-	-	-	3,013
Provision	9,452	(403)	(193)	-	8,856
Ending Balance	\$ 87,562	\$ 10,878	\$ 1,425	\$ -	\$ 99,865

	2022				
	Commercial	Agricultural	Residential	Student	TOTAL
Beginning Balance:	\$ 92,003	\$ 14,177	\$ 1,867	\$ -	\$ 108,047
Charge-offs	(1,276)	-	-	-	(1,276)
Recoveries	1,981	-	-	-	1,981
Provision	2,178	(1,777)	(401)	-	-
Ending Balance	\$ 94,886	\$ 12,400	\$ 1,466	\$ -	\$ 108,752

In addition to the ACL on loans, the Bank has established an ACL on off-balance sheet exposures of \$12,847 at December 31, 2023. The following table present the activity in the ACL on off-balance sheet exposures for the year ended December 31, 2023.

	2023
Beginning Balance	\$ -
Impact of adopting ASC 326	14,196
(reversals) to ACL recorded as provision for credit losses	(1,349)
Ending Balance	\$ 12,847

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The following tables disaggregate the Bank's allowance for credit losses by impairment methodology.

	2022				
	Commercial	Agricultural	Residential	Student	TOTAL
Collectively evaluated	\$ 79,499	\$ 11,252	\$ 1,466	\$ -	\$ 92,217
Individually evaluated	15,387	1,148	-	-	16,535
Total	<u>\$ 94,886</u>	<u>\$ 12,400</u>	<u>\$ 1,466</u>	<u>\$ -</u>	<u>\$ 108,752</u>

The following tables disaggregate the Bank's loan portfolio by impairment methodology.

	2022				
	Commercial	Agricultural	Residential	Student	TOTAL
Collectively evaluated	\$ 2,696,852	\$ 653,365	\$ 345,186	\$ -	\$ 3,695,403
Individually evaluated	81,297	23,100	5,638	-	110,035
Loan types excluded from allowance	421,128	33,401	252	1,104,408	1,559,189
Total	<u>\$ 3,199,277</u>	<u>\$ 709,866</u>	<u>\$ 351,076</u>	<u>\$ 1,104,408</u>	<u>\$ 5,364,627</u>

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The Bank's internally assigned ratings are as follows:

	Risk Code	Description
Exceptional	1	Loan considered prime on the basis of very substantial financial capacity with minimal risk of non payment.
Excellent	2	Loan considered sound on the basis of strong financial capacity with little or no apparent weakness and very limited risk of non payment. The probability of serious financial deterioration is highly unlikely.
Good	3	Loan may reveal weaknesses in some areas, however, not of a serious nature and the debt remains collectible in its entirety. The collateral may be characterized as being less marketable than that of a higher rated borrower.
Acceptable	4	Bank feels that the credit risk is acceptable, but may require above average officer attention. Credit in this class exhibit the earliest signs of potential problems. A greater reliance will be placed on the quality and marketability of the underlying collateral as the cash flow may be unproven or somewhat erratic.
Special Mention	5	May be bankable based on certain types of loan programs which fall within the Bank's mission. This type of loan may be currently protected, but has potential unrealized weaknesses. The loan will require close monitoring as deterioration remains a strong possibility. The potential problems must remain manageable and must not pose a serious threat to repayment.
Substandard	6	Well defined weaknesses jeopardize orderly repayment. The loan is no longer protected by sound net worth or repayment capacity of the borrower. Even though elements of loss are present, the borrower can potentially repay if deficiencies are corrected. Close monitoring of this type of loan is extremely important to prevent loss to the Bank.
Doubtful	7	Loan had deteriorated to the point where collection or liquidation in full on the basis of current information, conditions and values is highly questionable and improbable. A doubtful classification is warranted during this period of quantifying/defining the amount of exposure or loss. A well defined corrective action or liquidation plan should be developed and implemented as soon as possible to limit further loss potential for the Bank.
Loss	8	Loan is considered uncollectible and of such value that it should be charged-off. This classification does not mean that the asset has no recovery or salvage value.

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The following tables represents credit exposures by internally assigned risk ratings for the years ended December 31, 2023 and 2022. The rating analysis estimates the capability of the borrower to repay the contractual obligations of the loan agreements as scheduled or at all. The Bank's internal credit risk rating is based on experiences with similarly rated loans. Credit risk ratings are refreshed periodically as they become available, at which time management analyzes the resulting scores, as well as other external statistics and factors, to track loan performance.

2023					
Risk Rating	Commercial	Bank Stock	Business Loans	Farm & Ranch	Farm Real
	Participations		(Including PACE)		Estate
No assigned risk rating	\$ -	\$ -	\$ -	\$ -	\$ -
1	4,022	-	147,526	-	-
2	4,353	243	14,170	12,031	4,564
3	701,839	357,502	257,664	67,989	97,951
4	1,325,866	41,370	455,905	72,273	260,633
5	63,490	-	30,869	7,397	22,207
6	80,755	-	10,342	1,665	4,234
7	5,321	-	32	101	-
8	-	-	-	-	-
Loan types excluded from allowance	-	-	143,628	-	-
Total	\$ 2,185,646	\$ 399,115	\$ 1,060,136	\$ 161,456	\$ 389,589

Risk Rating	All Other	Residential	Student Loans	Total
	Farm Loans	Real Estate		
No assigned risk rating	\$ -	\$ 315,925	\$ -	\$ 315,925
1	-	-	-	151,548
2	4,706	-	-	40,067
3	41,239	-	-	1,524,184
4	90,263	-	-	2,246,310
5	11,922	-	-	135,885
6	3,292	-	-	100,288
7	56	-	-	5,510
8	-	-	-	-
Loan types excluded from allowance	31,714	228	1,063,453	1,239,023
Total	\$ 183,192	\$ 316,153	\$ 1,063,453	\$ 5,758,740

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2022					
Risk Rating	Commercial Participations	Bank Stock	All Other Business Loans (Including PACE)	Farm & Ranch	Farm Real Estate
No assigned risk rating	\$ -	\$ -	\$ -	\$ -	\$ -
1	4,606	-	3,687	-	-
2	5,783	-	13,396	8,055	1,596
3	606,447	321,178	182,512	48,641	89,676
4	1,004,299	40,871	415,126	50,198	280,055
5	60,105	-	32,473	5,683	23,592
6	76,696	-	9,430	23,350	3,595
7	1,483	-	46	110	-
8	-	-	11	-	-
Loan types excluded from allowance	-	-	421,128	-	-
Total	\$ 1,759,419	\$ 362,049	\$ 1,077,809	\$ 136,037	\$ 398,514

Risk Rating	All Other Farm Loans	Residential Real Estate	Student Loans	Total
No assigned risk rating	\$ -	\$ 350,824	\$ -	\$ 350,824
1	-	-	-	8,293
2	1,826	-	-	30,656
3	29,718	-	-	1,278,172
4	84,847	-	-	1,875,396
5	19,579	-	-	141,432
6	5,874	-	-	118,945
7	70	-	-	1,709
8	-	-	-	11
Loan types excluded from allowance	33,401	252	1,104,408	1,559,189
Total	\$ 175,315	\$ 351,076	\$ 1,104,408	\$ 5,364,627

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The following tables include an aging analysis of the recorded investment of past due financing receivables as of December 31, 2023 and 2022. Also included are loans that are 90 days or more past due with interest and principal still accruing, because they are (1) well-secured and in the process of collection, (2) real estate loans or loans exempt under regulatory rules from being classified as nonaccrual or (3) student loans where accrued interest is guaranteed.

Loan Class	2023						
	31-60 days past due	61 - 90 days past due	Greater than 90 days	Total Past Due	Current	Total Loans	Investment >90 days and accruing
Commercial Participations	\$ 3,151	\$ 3,732	\$ 22,864	\$ 29,747	\$ 2,155,899	\$ 2,185,646	\$ -
Bank Stock	-	-	-	-	399,115	399,115	-
All other Business Loans (Including PACE)	1,135	781	2,249	4,165	1,055,971	1,060,136	2
Farm & Ranch	22,434	-	-	22,434	139,022	161,456	-
Farm Real Estate	3,463	-	476	3,939	385,650	389,589	476
All other Farm loans	440	183	888	1,511	181,681	183,192	802
Residential Real Estate	7,743	3,592	2,644	13,979	302,174	316,153	2,644
Student Loans	11,095	5,306	15,325	31,726	1,031,727	1,063,453	15,325
Totals	\$ 49,461	\$ 13,594	\$ 44,446	\$ 107,501	\$ 5,651,239	\$ 5,758,740	\$ 19,249

Loan Class	2022						
	31-60 days past due	61 - 90 days past due	Greater than 90 days	Total Past Due	Current	Total Loans	Investment >90 days and accruing
Commercial Participations	\$ 7,036	\$ 7,088	\$ 7,820	\$ 21,944	\$ 1,737,475	\$ 1,759,419	\$ -
Bank Stock	-	-	-	-	362,049	362,049	-
All other Business Loans (Including PACE)	558	12	898	1,468	1,076,341	1,077,809	465
Farm & Ranch	105	-	-	105	135,932	136,037	-
Farm Real Estate	5,189	272	1,733	7,194	391,320	398,514	1,733
All other Farm loans	191	70	-	261	175,054	175,315	-
Residential Real Estate	9,407	3,068	4,832	17,307	333,769	351,076	4,832
Student Loans	13,575	4,928	15,652	34,155	1,070,253	1,104,408	15,652
Totals	\$ 36,061	\$ 15,438	\$ 30,935	\$ 82,434	\$ 5,282,193	\$ 5,364,627	\$ 22,682

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The following table presents the amortized cost basis of loans on nonaccrual status and loans past due over 89 days still accruing as of the years ended December 31, 2023.

	December 31, 2023		
	Nonaccrual	Nonaccrual With No Allowance for Credit Loss	Loans Past Due Over 89 Days Still Accruing
Commercial Participations	\$ 28,031	\$ 6,020	\$ -
All Other Business Loans (Including PACE)	2,255	390	2
Farm & Ranch	432	432	-
Farm Real Estate	-	-	476
All Other Farm Loans	86	-	802
Residential Real Estate	-	-	2,644
Student Loans	-	-	15,325
Total	<u>\$ 30,804</u>	<u>\$ 6,842</u>	<u>\$ 19,249</u>

The Bank recognized \$109 of interest income on nonaccrual loans during the year ended December 31, 2023. The Bank charged-off \$353 of accrued interest during the year ended December 31, 2023.

Accruing loans 90 days or more past due include guaranteed student loans of \$15,325 and \$15,652 as of December 31, 2023 and 2022, respectively. The Bank is entitled to reimbursement from the guarantor 270 days after default in the case of a student loan payable in monthly installments and 330 days in the case of a student loan payable in less frequent installments.

Residential loans of \$2,644 and \$4,832 as of December 31, 2023 and 2022, respectively, are also included in accruing loans 90 days or more past due.

A loan which meets any of the following criteria must be placed in a non-accrual status:

- The following loans on which the principal and interest is 90 or more days past due: Unsecured loans, loans secured by other than real property, loans secured by a mortgage on commercial real estate, loans secured by a farm real estate mortgage, loans secured by a conventional residential real estate mortgage.
- A loan where the borrower has filed for bankruptcy or where the lead bank or the Bank deems itself insecure due to the financial condition of the borrower.
- A loan which the North Dakota Department of Financial Institutions recommends to be placed in a non-accrual status.

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A loan which meets the criteria for non-accrual status may be retained in accrual status if it is (1) guaranteed or insured by the state or federal government or secured by collateral with a fair market value sufficient to discharge the outstanding principal and interest and (2) in the process of collection supported by a document source of collection.

A loan which has been placed in a non-accrual status may be returned to an accrual status only if principal and interest are no longer due and unpaid and if current principal and interest appear to be collectable. In addition, the loan must either be secured by collateral with a fair market value sufficient to discharge the outstanding principal and interest or the borrower must demonstrate through a documented repayment plan the ability to discharge the outstanding principal and interest.

In the event of a foreclosure a residential loan guaranteed by the Federal Housing Administration will be paid in full and the property title is transferred to them with the exception of flooded properties. The Department of Veterans Affairs has the option of paying their guaranty percentage and the Bank keeps the foreclosed property as well as any gain or loss from the sale or they can pay the loan in full and title is transferred to them.

The following table presents the amortized cost basis of collateral dependent loans, by the primary collateral type, which are individually evaluated to determine expected credit losses, and the related ACL allocated to these loans as of December 31, 2023.

	December 31, 2023				
	<u>Real Estate</u>	<u>Equipment</u>	<u>Other</u>	<u>Total</u>	<u>ACL</u>
Commercial Participations	\$ 9,986	\$ 14,372	\$ 5,375	\$ 29,733	\$ 4,988
Bank Stock	-	-	-	-	-
All Other Business Loans (Including PACE)	2,271	152	76	2,499	620
Farm & Ranch	-	433	101	534	23
Farm Real Estate	1,316	-	-	1,316	-
All Other Farm Loans	1,770	468	-	2,238	30
Residential Real Estate	702	-	-	702	-
Student Loans	-	-	-	-	-
Total	\$ 16,045	\$ 15,425	\$ 5,552	\$ 37,022	\$ 5,661

The following table includes the recorded investment and unpaid principal balances for impaired financing receivables with the associated allowance amount, if applicable. Management determined the specific allowance based on the present value of expected future cash flows, discounted at the loan's effective interest rate, except when the remaining source of repayment for the loan is the operation or liquidation of the collateral. In those cases, the current fair value of the collateral, less selling costs was used to determine the specific allowance recorded.

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Also presented are the average recorded investments in the impaired loans during the time within the period that the impaired loans were impaired. When the ultimate collectability of the total principal of an impaired loan is in doubt and the loan is on nonaccrual status, all payments are applied to principal, under the cost recovery method. When the ultimate collectability of the total principal of an impaired loan is not in doubt and the loan is on nonaccrual status, contractual interest is credited to interest income when received, under the cash basis method.

Loan Class	2022					Interest Income Recognized
	Recorded Investment	Unpaid Principal Balance (1)	Associated Allowance	Average Recorded Investment		
With No Specific Allowance Recorded:						
Commercial Participations	\$ 29,195	\$ 29,195	\$ -	\$ 30,356	\$ 959	
Bank Stock	-	-	-	-	-	
All other Business Loans (Including PACE)	2,028	2,240	-	2,392	96	
Farm & Ranch	1,670	1,670	-	1,684	25	
Farm Real Estate	1,090	1,090	-	1,111	27	
All other Farm loans	15,701	15,701	-	16,189	537	
Residential Real Estate	5,638	5,638	-	5,701	218	
With an Allowance Recorded:						
Commercial Participations	\$ 43,038	\$ 43,288	\$ 13,616	\$ 44,621	\$ 1,743	
Bank Stock	-	-	-	-	-	
All other Business Loans (Including PACE)	7,036	7,036	1,771	7,172	353	
Farm & Ranch	806	806	185	813	44	
Farm Real Estate	-	-	-	-	-	
All other Farm loans	3,833	3,833	963	3,994	125	
Residential Real Estate	-	-	-	-	-	
Totals:						
Commercial Participations	\$ 72,233	\$ 72,483	\$ 13,616	\$ 74,977	\$ 2,702	
Bank Stock	-	-	-	-	-	
All other Business Loans (Including PACE)	9,064	9,276	1,771	9,564	449	
Farm & Ranch	2,476	2,476	185	2,497	69	
Farm Real Estate	1,090	1,090	-	1,111	27	
All other Farm loans	19,534	19,534	963	20,183	662	
Residential Real Estate	5,638	5,638	-	5,701	218	

(1) Represents the borrower's loan obligation, gross of any previously charged-off amounts.

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Occasionally, the Bank may modify loans to borrowers who are experiencing financial difficulty. Loan modifications to borrowers experiencing financial difficulty may be in the form of principal forgiveness, term extension, an other-than-insignificant payment delay, interest rate reduction, or combination thereof.

The following table presents the amortized cost basis of loans that were both, experiencing financial difficulty and modified by loan type and type of modification for the year ended December 31, 2023.

	December 31, 2023						
	Principal Forgiveness	Payment Delay	Term	Interest Rate Reduction	Combination Term Extension and Principal Forgiveness	Combination Term Extension and Interest Rate	Percentage of Modifications Relative to Year-End Balance
Commercial Participations	\$ -	\$ 8,071	\$ 4,278	\$ -	\$ -	\$ -	1%
Bank Stock	-	-	-	-	-	-	0%
All Other Business Loans (Including PACE)	-	77	-	-	-	-	0%
Farm & Ranch	-	-	359	-	-	-	0%
Farm Real Estate	-	1,316	-	-	-	-	0%
All Other Farm Loans	-	-	-	-	-	-	0%
Residential Real Estate	-	-	-	-	-	-	0%
Student Loans	-	-	-	-	-	-	0%
Total	\$ -	\$ 9,464	\$ 4,637	\$ -	\$ -	\$ -	0%

The following table presents information related to loans modified in a troubled debt restructuring during the year ended December 31, 2022. There were three of these loans subsequently defaulted after modification status during the year ended December 31, 2022.

	2022	
	Number of Modifications	Recorded Investment
Commercial Participations	2	\$ 7,628
All Other Business Loans (Including PACE)	2	440
All Other Farm Loans	2	673
Residential Real Estate	-	-
TOTAL	6	\$ 8,741

The Bank has no material commitments to lend additional funds to customers whose loans were classified as impaired or restructured at December 31, 2023 and 2022 to borrowers included in the tables above.

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The following table presents the financial effect of the loan modifications presented above to the borrowers experiencing financial difficulty for the year ended December 31, 2023.

	<u>December 31, 2023</u>		
	<u>Principal Forgiveness</u>	<u>Weighted Average Interest Rate Reduction</u>	<u>Weighted Average Term Extension (Yrs)</u>
Commercial Participations	\$ -	0.00%	5
Bank Stock	-	0.00%	-
All Other Business Loans (Including PACE)	-	0.00%	-
Farm & Ranch	-	0.00%	1
Farm Real Estate	-	0.00%	-
All Other Farm Loans	-	0.00%	-
Residential Real Estate	-	0.00%	-
Student Loans	-	0.00%	-
	<u>\$ -</u>	<u>0.00%</u>	<u>6</u>

The Bank closely monitors the performance of loans modified to borrowers experiencing financial difficulty to understand the effectiveness of its loan modifications. All loans modified during the year ended December 31, 2023 are current. None of the loans modified for the period were payment default during the year ended December 31, 2023.

The following table presents loans purchased and sold during the year ended December 31, 2023. The Bank considers all newly originated participations as purchased loans, as reflected below.

	<u>December 31, 2023</u>	
	<u>Purchases</u>	<u>Sales</u>
Commercial Participations	\$ 652,294	\$ -
Bank Stock	-	-
All Other Business Loans (Including PACE)	195,351	-
Farm & Ranch	76,091	-
Farm Real Estate	-	-
All Other Farm Loans	33,505	-
Residential Real Estate	-	-
Student Loans	-	-
Total	<u>\$ 957,241</u>	<u>\$ -</u>

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NOTE 5 - LOAN SALES AND LOAN SERVICING

BND has contracts to provide servicing of loans for others. These loans are not included in the accompanying balance sheets. The unpaid principal balances of loans serviced for others as of December 31, 2023 and 2022 were as follows:

	<u>2023</u>	<u>2022</u>
Student loans		
North Dakota Student Loan Trust	\$ 472	\$ 522
Residential loans		
Fannie Mae	17,455	19,281
Other state fund loans		
School Construction Assistance Revolving Loan Fund	313,989	273,538
Infrastructure Revolving Loan Fund	167,101	121,440
Medical Facility Infrastructure Loan Fund	41,528	43,510
Rebuilders Loan Program	32,246	38,257
State Water Commission	539	550
Water Infrastructure Revolving Loan Fund	43,708	37,299
Board of University and School Lands	2,373	3,962
Information Technology Department	695	1,070
Department of Human Services	2,082	2,532
Addiction Counseling Internship Loan Program	69	76
Workforce Safety	40	51
Clean Sustainable Energy	43,018	30,000
Legacy Investment for Technology Fund	25,608	21,087
Bulk Propane Storage	571	-
Legacy Infrastructure Loan Fund	49,169	-
	<u>\$ 740,663</u>	<u>\$593,175</u>

Under existing student loan servicing agreements, the Bank generally agrees to reimburse lenders for all principal, accrued interest and special allowance which the lender has been denied if the denial resulted from the actions or inactions of the Bank. Under the existing residential loan servicing agreement with Fannie Mae, the Bank will indemnify Fannie Mae and hold them harmless against all losses, damages, judgments, or legal expenses that result from the Bank's failure in any way to perform its services and duties.

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NOTE 6 - BANK PREMISES, EQUIPMENT, AND SOFTWARE

A summary of the cost and accumulated depreciation of premises and equipment follows:

	<u>2023</u>	<u>2022</u>
Land	\$ 2,449	\$ 2,449
Building	10,342	10,327
Equipment	789	724
Furniture	817	817
Software	<u>6,491</u>	<u>6,186</u>
	20,888	20,503
Less accumulated depreciation	<u>11,739</u>	<u>11,192</u>
	\$ 9,149	\$ 9,311

Depreciation expense totaled \$547 and \$379 for the years ended December 31, 2023 and 2022, respectively.

NOTE 7 - DEPOSITS

As of December 31, 2023, the scheduled maturities of certificates of deposits are as follows:

One year or less	\$ 4,733,148
One to three years	246,410
Over three years	<u>680,772</u>
	\$ 5,660,330

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NOTE 8 - FEDERAL HOME LOAN BANK (FHLB) ADVANCES

Short and long-term debt consists of:

	<u>2023</u>	<u>2022</u>
Federal Home Loan Bank advances - short-term	<u>\$ 25,000</u>	<u>\$ 675,000</u>
	<u>\$ 25,000</u>	<u>\$ 675,000</u>

A summary, by years, of future minimum payments required to amortize the outstanding short and long-term debt is as follows:

	<u>Principal</u>	<u>Interest</u>	<u>Total</u>
2024	<u>\$ 25,000</u>	<u>\$ 15</u>	<u>\$ 25,015</u>

The FHLB short-term advances outstanding as of December 31, 2023 all matured in January 2024 and had a fixed interest rate of 5.64%. The FHLB short-term advances outstanding as of December 31, 2022 all matured in January 2023 and had fixed interest rates ranging from 4.44% to 4.60%. All FHLB advances must be secured by minimum qualifying collateral maintenance levels. Residential, agriculture, and commercial loans with carrying values of \$864,435 and \$691,798 as of December 31, 2023 and 2022, respectively, are currently being used as security to meet these minimum levels.

NOTE 9 - OTHER ASSETS

	<u>2023</u>	<u>2022</u>
Fees receivable	1,080	2,492
Securities receivable	28,421	4,737
Interest rate swap receivable	52,125	63,068
Foreclosed assets	4,223	4,249
Prepaid expenses, deferred expenses and other receivables	835	1,016
	<u>\$ 86,684</u>	<u>\$ 75,562</u>

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NOTE 10 - OTHER LIABILITIES

Other Liabilities consist of:

	<u>2023</u>	<u>2022</u>
Interest payable	\$ 8,234	\$ 2,597
Salary and benefits payable	3,154	2,775
ACL on unfunded loan commitments	12,847	-
Accounts payable, accrued expenses and other liabilities	<u>3,948</u>	<u>463</u>
	<u>\$ 28,183</u>	<u>\$ 5,835</u>

NOTE 11 - PENSION PLAN

NDPERS is a cost-sharing multiple-employer defined benefit pension plan that covers substantially all employees of the State of North Dakota, its agencies and various participating political subdivisions. NDPERS provides for pension, death and disability benefits. The cost to administer the plan is financed through the contributions and investment earnings of the plan.

Responsibility for administration of the NDPERS defined benefit pension plan is assigned to a Board comprised of nine members. The Board consists of a Chairman, who is appointed by the Governor; one member appointed by the Attorney General; one member appointed by the State Health Officer; three members elected by the active membership of the NDPERS system, one member elected by the retired public employees and two members of the legislative assembly appointed by the chairman of the legislative management.

Death and disability benefits are set by statute. If an active member dies with less than three years of service for the Main System, a death benefit equal to the value of the member's accumulated contributions, plus interest, is paid to the member's beneficiary. If the member has earned more than three years of credited service for the Main System, the surviving spouse will be entitled to a single payment refund, life-time monthly payments in an amount equal to 50% of the member's accrued normal retirement benefit, or monthly payments in an amount equal to the member's accrued 100% Joint and Survivor retirement benefit if the member had reached normal retirement age prior to date of death. If the surviving spouse dies before the member's accumulated pension benefits are paid, the balance will be payable to the surviving spouse's designated beneficiary.

Eligible employees who become totally disabled after a minimum of 180 days of service receive monthly disability benefits that are equal to 25% of their final average salary with a minimum benefit of \$100. To qualify under this section, the member has to become disabled during the period of eligible employment and apply for benefits within one year of termination. The definition for disabled is set by the NDPERS in the North Dakota Administrative Code.

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Benefits are set by statute. NDPERS has no provisions or policies with respect to automatic and ad hoc post-retirement benefit increases. Member of the Main System are entitled to unreduced monthly pension benefits beginning when the sum of age and years of credited service equal or exceed 85 (Rule of 85), or at normal retirement age (65). For members hired on or after January 1, 2016 the Rule of 85 was replaced with the Rule of 90 with a minimum age of 60. The monthly pension benefit is equal to 2.00% of their average monthly salary, using the highest 36 months out of the last 180 months of service, for each year of service. For members hired on or after January 1, 2020 the 2.00% multiplier was replaced with a 1.75% multiplier. The plan permits early retirement at ages 55-64 with three or more years of service.

Members may elect to receive the pension benefits in the form of a single life, joint and survivor, term-certain annuity, or partial lump sum with ongoing annuity. Members may elect to receive the value of their accumulated contributions, plus interest, as a lump sum distribution upon retirement or termination, or they may elect to receive their benefits in the form of an annuity. For each member electing an annuity, total payment will not be less than the members' accumulated contributions plus interest.

Member and employer contributions paid to NDPERS are set by statute and are established as a percent of salaries and wages. Member contribution rates are 7% and employer contribution rates are 7.12% of covered compensation. For members hired on or after January 1, 2020 member contribution rates are 7% and employer contribution rates are 8.26% of covered compensation.

The member's account balance includes the vested employer contributions equal to the member's contributions to an eligible deferred compensation plan. The minimum member contribution is \$25 and the maximum may not exceed the following:

- 1 to 12 months of service – Greater of one percent of monthly salary or \$25
- 13 to 24 months of service – Greater of two percent of monthly salary or \$25
- 25 to 36 months of service – Greater of three percent of monthly salary or \$25
- Longer than 36 months of service – Greater of four percent of monthly salary or \$25

Bank of North Dakota's required and actual contributions to NDPERS for the fiscal years ending December 31, 2023 and 2022 were approximately \$1,623 and \$1,461, respectively, and are charged directly to operations. There were no surcharges paid by the Bank to the Plan in 2023 and 2022.

Specific plan assets and accumulated benefit information for the Bank's portion of the fund is not available. Under the Employee Retirement Income and Security Act of 1974 ("ERISA"), a contributor to a multi-employer pension plan may be liable in the event of complete or partial withdrawal for the benefit payments guaranteed under ERISA, but there is no intention to withdraw. NDPERS operates as a multi-employer plan for accounting purposes and as a multiple-employer plan under ERISA and the Internal Revenue Code. There are no collective bargaining agreements in place that require contributions to the Plan. As of December 31, 2023, and 2022, there were no funding improvement plans or rehabilitation plans implemented. The Plan is a single plan under Internal Revenue Code 413(c) and, as a result, all of the assets stand behind all of the liabilities. Accordingly, contributions made by a participating employer may be used to provide benefits to participants of other participating employers.

NDPERS issues a publicly available financial report that includes financial statements and the required supplementary information for NDPERS. The Bank's contributions to the Plan do not represent more than 5 percent of total contributions to the Plan as indicated in the Plan's most recently available annual report as of June 30, 2023. That report may be obtained by writing to NDPERS; 400 East Broadway, Suite 505; PO Box 1657; Bismarck, ND 58502-1657.

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NOTE 12 - COMMITMENTS AND CONTINGENT LIABILITIES

Legislative Action – Various legislative bills provide state agencies the authority to borrow money from the Bank of North Dakota during the biennium beginning July 1, 2023 and ending June 30, 2025. Following is a summary of legislative action and/or North Dakota Statute in effect:

H.B. 1014, Section 11 – The Industrial Commission shall transfer to the general fund \$140,000 from the current earnings and the accumulated undivided profits of the Bank of North Dakota during the biennium beginning July 1, 2023 and ending June 30, 2025. The moneys must be transferred in the amounts and at the times requested by the Director of the Office of Management and Budget after consultation with the Bank of North Dakota president. As of December 31, 2023, the Bank had transferred \$0.

H.B. 1014, Section 12 – The Bank shall transfer up to \$39,000 from its current earnings and undivided profits to the Partnership in Assisting Community Expansion Fund during the biennium beginning July 1, 2023 and ending June 30, 2025. As of December 31, 2023, the Bank had transferred \$7,000.

H.B. 1014, Section 12 – The Bank shall transfer up to \$5,000 from its current earnings and undivided profits to the Agriculture Partnership in Assisting Community Expansion Fund during the biennium beginning July 1, 2023 and ending June 30, 2025. As of December 31, 2023, the Bank had transferred \$2,000.

H.B. 1014, Section 12 – The Bank shall transfer up to \$1,000 from its current earnings and undivided profits to the Biofuels Partnership in Assisting Community Expansion Fund during the biennium beginning July 1, 2023 and ending June 30, 2025. As of December 31, 2023, the Bank had transferred \$500.

H.B. 1014, Section 12 – The Bank shall transfer up to \$15,000 from its current earnings and undivided profits to the Beginning Farmer Revolving Loan Fund during the biennium beginning July 1, 2023 and ending June 30, 2025. As of December 31, 2023, the Bank had transferred \$1,000.

H.B. 1014, Section 12 – The Bank shall transfer up to \$1,500 from its current earnings and undivided profits to the University of North Dakota Small Business Development Center during the biennium beginning July 1, 2023 and ending June 30, 2025. As of December 31, 2023, the Bank had transferred \$1,500.

H.B. 1003, Section 7 – The Bank shall transfer the sum of \$1,500 or so much of the sum as may be necessary from its current earnings and undivided profits to the State Board of Higher Education Scholarships during the biennium beginning July 1, 2023 and ending June 30, 2025. As of December 31, 2023, the Bank had transferred \$0.

H.B. 1003, Section 8 – The Bank shall transfer the sum of \$3,400 or so much of the sum as may be necessary from its current earnings and undivided profits to the Skilled Workforce Student Loan Repayment Program Fund during the biennium beginning July 1, 2023 and ending June 30, 2025. As of December 31, 2023, the Bank had transferred \$100.

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H.B. 1003, Section 9 – The Bank shall transfer the sum of \$3,400 or so much of the sum as may be necessary from its current earnings and undivided profits to the Skilled Workforce Scholarship Fund during the biennium beginning July 1, 2023 and ending June 30, 2025. As of December 31, 2023, the Bank had transferred \$400.

H.B. 1012, Section 4 – The Department of Transportation may borrow from the Bank, up to \$50,000, which is appropriated to the Department for matching federal funds that may become available, for the biennium beginning July 1, 2023 and ending June 30, 2025. As of December 31, 2023, there was no outstanding balance.

H.B. 1012, Section 5 – The Department of Transportation may borrow from the Bank, up to \$28,500, which is appropriated to the Department for the contingent loan authorization line item in section 1 of this Act for matching funds made available from the state of Minnesota for northern Red River Valley transportation projects, for the biennium beginning July 1, 2023 and ending June 30, 2025. As of December 31, 2023, there was no outstanding balance.

H.B. 1242, Section 2 – The Bank of North Dakota shall transfer the sum of \$20,000, or so much of the sum as may be necessary, from the Bank's current earnings and undivided profits to the Statewide Interoperable Radio Network fund during the biennium beginning July 1, 2023, and ending June 30, 2025. As of December 31, 2023, the Bank had transferred \$0.

H.B. 1003, Section 10 – The Office of Management and Budget shall transfer \$5,500 from the strategic investment and improvements fund to the economic diversification research fund, the sum of which is appropriated to the Bank of North Dakota for the purpose of providing grants to institutions under the control of the State Board of Higher Education, for the biennium beginning July 1, 2023, and ending June 30, 2025, as requested by the commissioner of higher education. As of December 31, 2023, SIIF had transferred \$5,500.

H.B. 1003, Section 13 – The legislative assembly authorizes the Mayville State University Old Main renovation project to be funded in two phases as provided under this section. The capital assets line item in subdivision 9 of section 1 of this Act includes the sum of \$17,330, or so much of the sum as may be necessary, for phase 1 of the project. During the biennium beginning July 1, 2023, and ending June 30, 2025, and continuing into the biennium beginning July 1, 2025, and ending June 30, 2027, the State Board of Higher Education may borrow the sum of \$34,925, or so much of the sum as may be necessary, from the Bank of North Dakota for completion of phase 2 of the Mayville State University Old Main renovation project. The State Board of Higher Education shall seek funding from the sixty-ninth legislative assembly to repay the loan authorized under this section. As of December 31, 2023, no funds have been utilized.

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H.B. 1199, Section 2 – The Bank of North Dakota shall extend a line of credit not to exceed \$68,276 to the Department of Career and Technical Education at the prevailing interest rate charged to North Dakota governmental entities, the sum of which is appropriated to the Department of Career and Technical Education for the purpose of providing grants to entities approved by the State Board for Career and Technical Education to build career academies through the statewide area and career center initiative grant program for the period beginning with the effective date of this Act, and ending June 30, 2025. The department may award funding provided in this section to foundations that are working with school districts on career academy projects approved by the state board for career and technical education. The department shall repay the line of credit and accrued interest from funding appropriated from the general fund in section 1 of this Act and from funding appropriated from the federal coronavirus capital projects fund in section 1 of chapter 548 of the 2021 Session Laws. If moneys available on June 30, 2025, are not sufficient to repay the line of credit, the department of career and technical education shall request from the sixty-ninth legislative assembly a deficiency appropriation to repay the line of credit. As of December 31, 2023, there was no outstanding balance.

S.B. 2009, Section 10 – The Bank shall transfer the sum of \$3,000 or so much of the sum as may be necessary from its current earnings and undivided profits to the Agriculture Commissioner for deposit in the Agriculture Products Utilization Commission Fund during the biennium beginning July 1, 2023 and ending June 30, 2025. As of December 31, 2023, the Bank had transferred \$3,000.

S.B. 2020, Section 11 – The Bank of North Dakota shall extend a line of credit not to exceed \$100,000 at the prevailing interest rate charged to North Dakota government entities. The Department of Water Resources shall repay the line of credit from funds available in the Resources Trust Fund, Water Development Trust Fund, or other funds, as appropriated by the legislative assembly. The Department of Water Resources may access the line of credit, as necessary, to provide up to \$50,000 for the Northwest Area Water Supply project and up to \$50,000 for the Southwest Pipeline project during the biennium beginning July 1, 2023, and ending June 30, 2025. As of December 31, 2023, there were no funds extended on the line.

H.B. 1014, Section 23 – The Bank shall extend a line of credit not to exceed \$390,000 to the industrial commission to support loans or loan guarantees issued from the Clean Sustainable Energy Fund. The interest rate associated with the line of credit must be the prevailing interest rate charged to North Dakota government entities. As of December 31, 2023, the Bank had extended \$12,930.

H.B. 1014, Section 8 – The sum of \$1,818, or so much of the sum as may be necessary, included in the appropriation in subdivision 1 of section 1 of this Act, may be transferred from the entities within the control of the industrial commission or entities directed to make payments to the industrial commission fund for administrative services rendered by the commission. Transfers must be made during the biennium beginning July 1, 2023, and ending June 30, 2025, upon order of the commission. Transfers from the student loan trust fund must be made to the extent permitted by sections 54-17-24 and 54-17-25. As of December 31, 2023, the Bank had transferred \$138.

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Continuing Commitments and Contingent Liabilities

H.B. 1025, Section 3 – It is the intent of the sixty-seventh legislative assembly that the Attorney General seek reimbursement from the federal government for the costs of responding to unlawful activity associated with the construction of the Dakota Access Pipeline. It is further the intent of the sixty-seventh legislative assembly that these reimbursements be used to repay the Bank of North Dakota loans authorized by the Emergency Commission and the Legislative Assembly which were obtained to provide the funding necessary to respond to the unlawful activity associated with the construction of the Dakota Access Pipeline. It is the further intent of the sixty-seventh legislative assembly that the provisions of section 54-16-13 apply to the loans, except that Emergency Commission approval does not apply. The unpaid principal balance as of December 31, 2023 and 2022 was \$13,362 and \$13,362, respectively.

S.B. 2124, Section 1 – The Bank of North Dakota shall adopt rules to administer, manage, promote, and market the North Dakota Achieving a Better Life Experience Plan. The Bank shall ensure the North Dakota Achieving a Better Life Experience Plan is maintained in compliance with internal revenue service standards for qualified state disability expense programs. The Bank, as trustee of the North Dakota Achieving a Better Life Experience Plan, may impose an annual administrative fee to recover expenses incurred in connection with operation of the plan. Administrative fees received by the Bank are appropriated to the Bank on a continuing basis to be used as provided under this section. Money and assets in North Dakota Achieving a Better Life Experience Plan accounts or in qualified Achieving a Better Life Experience plan accounts in any state may not be considered for the purpose of determining eligibility to receive, or the amount of, any assistance or benefits from local or state means-tested programs.

S.B. 2014, Section 17 – This bill is an amendment to Section 6-09-49 regarding the Infrastructure Revolving Loan Fund and provide definition for “essential infrastructure projects”. No new funding was provided, and no other changes to the program were made. The Infrastructure Revolving Loan Fund is a special fund in the State Treasury from which the Bank of North Dakota shall provide loans to political subdivisions for essential infrastructure projects. The Bank shall administer the Infrastructure Revolving Loan Fund. The maximum term of a loan made under this section is thirty years. A loan made from the Fund under this section must have an interest rate that does not exceed two percent per year. For purposes of this section, "essential infrastructure projects" means capital construction projects to construct new infrastructure or replace existing infrastructure, which provide the fixed installations necessary for the function of a political subdivision. As of December 31, 2023 and 2022, outstanding loans totaled \$167,101 and \$121,440, respectively.

S.B. 2018, Section 5 – The Bank of North Dakota shall extend a line of credit to the State Historical Society to provide funding to pay costs associated with the construction of a North Dakota Military Museum and related expansion projects for the State Historical Society. The line of credit may not exceed \$20,000, and the interest rate associated with the line of credit must be the prevailing rate charged to North Dakota government entities. It is the intent of the sixty-eighth legislative assembly that the State Historical Society request funding from the sixty-ninth legislative assembly from the legacy earnings fund to repay the line of credit. As of December 31, 2023, no funds have been utilized.

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S.B. 2019, Section 3 – The Bank of North Dakota shall extend a line of credit not to exceed \$70,000 to the Parks and Recreation Department for the Theodore Roosevelt Presidential Library project. The interest rate on the line of credit may not exceed the prevailing interest rate charged to North Dakota governmental entities. As of December 31, 2023, no funds have been utilized.

S.B. 2272, Section 4 – Provides for the creation of the School Construction Assistance Revolving Loan Fund. The School Construction Assistance Revolving Loan Fund is a special revolving loan fund administered by the Bank of North Dakota. The Fund consists of all moneys appropriated or transferred to the Fund by the Legislative Assembly and all interest or other earnings of the Fund, and all repayments of loans made from the Fund. Moneys in the Fund, interest upon the moneys in the Fund, and payments to the Fund of principal and interest are appropriated to the Bank of North Dakota on a continuing basis for the purpose of providing low-interest school construction loans and for paying administrative costs, in accordance with this section. With the advice and consent of the Superintendent of Public Instruction, the Bank of North Dakota shall award the loans in accordance with a prioritization system that is based on a review of all applications filed during the twelve-month period preceding April 1st. The maximum loan amount for which a school district may qualify is \$10,000. The term of the loan is twenty years, unless the board of the school district requests a shorter term in the written loan application. The interest rate of the loan may not exceed two percent per year. The Bank may adopt policies and establish guidelines to administer this loan program in accordance with this section. The Bank of North Dakota may use a portion of the interest paid on the outstanding loans as a servicing fee to pay for administration costs which may not exceed one - half of one percent of the amount of the interest payment. The Bank of North Dakota shall deposit principal and interest payments made by school districts for loans under this section in the School Construction Assistance Revolving Loan Fund. The Bank of North Dakota shall arrange for the conduct of an annual audit of the School Construction Assistance Revolving Loan Fund, the cost of which must be paid from the Fund and which must be conducted by an independent accounting firm. As of December 31, 2023 and 2022, outstanding loans in the School Construction Assistance Revolving Loan Fund totaled \$313,989 and \$273,538, respectively.

S.B. 2008, Section 4 – The Bank of North Dakota shall transfer from the Beginning Farmer Revolving Loan Fund to the Public Service Commission the sum of \$900, or so much of the sum as may be necessary, included in the estimated income line item in section 1 of this Act to pay for costs associated with a rail rate complaint case. Transfers must be made during the biennium beginning July 1, 2023, and ending June 30, 2025, upon order of the Commission. If any amounts are spent pursuant to this section, the Public Service Commission shall reimburse the Beginning Farmer Revolving Loan Fund using amounts available from damages or proceeds received, net of legal fees, from a successful outcome of a rail complaint case. As of December 31, 2023, the Bank had transferred \$0.

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State Water Commission

Under chapter 61-02.1-04 of North Dakota Century Code, principal and interest on bonds issued are payable from transfers to be made and appropriated by the Legislative Assembly from the Water Development Trust Fund as provided in section 61-02.1-05, then from transfers to be made and appropriated by the Legislative Assembly from revenues in the Resources Trust Fund other than revenues from state taxes, then from appropriations of other available revenues in the then current biennium, and then from any other revenues the State Water Commission makes available during the then current biennium for that purpose, including any federal moneys received by the state for the construction of flood control or reduction projects to pay bonds issued for that project. If sufficient funds from these sources are not available, then from transfers to be made and appropriated by the Legislative Assembly from the first available current biennial earnings of the Bank of North Dakota not to exceed \$6,500 per biennium prorated with any other bonds payable from transfers to be made and appropriated by the Legislative Assembly from the available current biennial earnings of the Bank of North Dakota, to be credited by the Trustee to the Fund established for paying principal and interest on the bonds under a trust indenture. If the Bank has to provide a transfer to the State Water Commission to make principal and interest payments on these bonds, the State Water Commission would then have to request from the next Legislative Assembly funding to repay the transfer made by the bank. As of December 31, 2023, the Bank has provided no such transfers.

Farm Real Estate Loan Guarantee Program

Chapter 6-09.7-09 provides that the Bank of North Dakota may guarantee the loan of money by banks, credit unions, lending institutions that are part of the farm credit system, and savings and loan associations in this state to eligible persons for the purchase of agricultural real estate or the restructuring of agricultural real estate loans, provided the transactions do not exceed a loan to value ratio of 80% and further provided that no single loan exceeds \$400. The Bank may have no more than \$8,000 in outstanding loan guarantees under this Program. The Bank may guarantee up to 75% of the amount of principal due the lender. The guarantee term may not exceed 5 years. As of December 31, 2023, and 2022, the Bank had guarantees outstanding totaling \$0 and \$0, respectively, and had no guarantee commitments outstanding, respectively, included in commitments to extend credit. The Bank has not recorded a contingent liability related to the guarantee loan program as of December 31, 2023 and 2022.

Self-Insurance Health Plan – Bank of North Dakota Line of Credit

Chapter 54-52.1 provides that the Bank shall extend to the Public Employees' Retirement Board a line of credit not to exceed \$50,000. The Board shall repay the line of credit from health insurance premium revenue or repay the line of credit from other funds appropriated by the Legislative Assembly. The Board may access the line of credit to the extent necessary to provide adequate claims payment funds, to purchase stop-loss coverage, and to defray other expenditures of administration of the self-insurance health plan. As of December 31, 2023, the outstanding loan balance was \$0.

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Invisible Reinsurance Pool – Bank of North Dakota Line of Credit

Chapter 26.1-36.7-.07 provides that the Bank shall extend to the Reinsurance Association of North Dakota a line of credit not to exceed \$25,000. The Association shall repay the line of credit from assessments against insurers writing or otherwise issuing group health benefit plans in this state or from other funds appropriated by the Legislative Assembly. As of December 31, 2023, the outstanding loan balance was \$0.

Establishment and Maintenance of Adequate Guarantee Funds – Use of Strategic Investment and Improvement Funds

Chapter 6-.09.7-05 provides that the Bank shall establish and at all times maintain an adequate guarantee reserve fund in a special account at the Bank. The Bank may request the Director of the Office of Management and Budget to transfer funds from the Strategic Investment and Improvement Fund (SIIF) created by this section 15-08.1-08 to maintain one hundred percent of the guarantee reserve fund balance. Transfers from SIIF may not exceed a total of \$150,000. Moneys in the guarantee reserve fund are available to reimburse lenders for guaranteed loans in default. The securities in which the moneys in the reserve fund may be invested must meet the same requirements as those authorized for investment under the State Investment Board. The income from such investments must be made available for the costs of administering the program and must be deposited in the reserve fund. The amount of the reserves for all guaranteed loans must be determined by a formula that will assure, as determined by the Bank, an adequate amount of reserve. As of December 31, 2023, the balance in the reserve fund was \$36,915.

Beginning Entrepreneur Loan Guarantee Program

Chapter 6-09.15 provides that the Bank of North Dakota provide a Beginning Entrepreneur Loan Guarantee Program. The Program includes an agreement with a lender that in the event of default by a beginning entrepreneur under a note and mortgage or other loan or financing agreement, the Bank shall pay the lender the amount agreed upon up to 85% of the amount of principal due the lender on a loan at the time the claim is approved. The total outstanding loans that the Bank may guarantee cannot exceed 5% of the Bank's tier one capital as defined by the Department of Financial Institutions. A lender may apply to the Bank for a loan guarantee for a loan up to \$500. The term of the guarantee may not exceed five years. As of December 31, 2023, and 2022, the Bank has guarantees outstanding totaling \$6,944 and \$7,561, respectively, and had guarantee commitments outstanding of \$309 and \$119, respectively, included in commitments to extend credit. The Bank has not recorded a contingent liability related to the guarantee loan program as of December 31, 2023 and 2022.

Rebuilders Permanent Loan Fund

H.B. 1187, Section 3 of the sixty-seventh legislative session combined the Small Employer Loan Fund with the Rebuilders Permanent Loan Fund. In response to the COVID-19 pandemic, the Bank of North Dakota created the Small Employer Loan Fund (SELF) to assist small businesses. The SELF program allowed businesses with a physical presence in North Dakota, and 10 full-time equivalents or less to borrow up to \$50 at one percent interest over 120 months. The Bank received applications for assistance up to November 30, 2020. The Bank committed up to \$50,000 of capital or so much as the sum as needed. As of December 31, 2023, the Bank transferred \$30,000.

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NOTE 13 - RELATED PARTY TRANSACTIONS

The Bank, because of its unique relationship with the State of North Dakota, is a party in many business transactions with other entities of state government. All state funds and funds of all state penal, education, and industrial institutions must be deposited in the Bank under state law. These transactions are a normal part of bank business and, accordingly, are included in the Bank's financial statements.

See Note 5 for disclosure relating to loans sold to other state funds and/or loans serviced for other state funds, including the North Dakota Student Loan Trust.

Dakota Education Alternative Loans are fully guaranteed by the North Dakota Guaranteed Student Loan Program, which is administered by the Bank. The outstanding principal balance of these loans was \$1,046,618 and \$1,084,281 as of December 31, 2023 and 2022, respectively.

In the ordinary course of business, the Bank holds loans and deposits of principal officers and directors and their affiliates. Outstanding principal balances of these loans held by the Bank as of December 31, 2023 and 2022 amounted to \$39,836 and \$38,556, respectively. Deposits and short-term borrowings held by the Bank were \$30,355 and \$25,165, respectively.

On December 22, 2020, the Bank signed a Servicing Agreement with the North Dakota Housing Finance Agency (NDHFA) effective April 1, 2021, to transfer the Bank's mortgage servicing to NDHFA. NDHFA paid the Bank the amount of the unamortized service release premium and services the mortgage loans and manages the premises in the event of foreclosure of any mortgage loans. As of year-end December 31, 2021, the Bank received from NDHFA \$1,077 in unamortized service release premiums and fees. NDHFA will service a total of \$283,744 in loans from BND. As of December 31, 2023 and 2022, the outstanding balance of loans serviced by NDHFA was \$189,846 and \$210,817, respectively. Mortgage servicing fees paid to NDHFA for the years ended December 31, 2023 and 2022 were \$497 and \$569, respectively.

NOTE 14 - OFF-BALANCE-SHEET ACTIVITIES

The Bank is a party to credit related financial instruments with off-balance-sheet risk in the normal course of business to meet the financing needs of its customers. These financial instruments include commitments to extend credit, financial standby letters of credit, and guarantees related to loan programs as discussed in Note 11. Such commitments involve, to varying degrees, elements of credit and interest rate risk in excess of the amount recognized in the balance sheet. The Bank's exposure to credit loss is represented by the contractual amount of these commitments. The Bank follows the same credit policies in making commitments as it does for on-balance-sheet instruments.

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As of December 31, 2023, and 2022, the following financial instruments were outstanding whose contract amounts represent credit risk:

	Contract Amount	
	2023	2022
Commitments to extend credit	\$ 2,073,963	\$ 1,859,343
Financial standby letters of credit	871,330	657,329
Guarantees provided	7,253	7,680

Commitments to extend credit are agreements to lend to a customer as long as there is no violation of any condition established in the contract. Commitments generally have fixed expiration dates or other termination clauses and may require payment of a fee. Since many of the commitments are expected to expire without being drawn upon, the total commitment amounts do not necessarily represent future cash requirements. The amount of collateral obtained by the Bank upon extension of credit is based on management's credit evaluation of the customer. Collateral held may include accounts receivable, inventory, property, plant, and equipment, and income-producing commercial properties.

Financial standby letters of credit are conditional commitments issued by the Bank to guarantee the performance of a customer to a third party. Those letters of credit are primarily issued to support public borrowing arrangements. The credit risk involved in issuing letters of credit is essentially the same as that involved in extending loan facilities to customers. The Bank has segmented this category into three components: (1) letters of credit, (2) confirming letters of credit, and (3) letters of credit pledged for public deposits to North Dakota financial institutions.

Letters of credit are conditional commitments issued by the Bank to guarantee the performance of a customer to a third party which require this type of facility. The maturities for these letters of credit range from one month to ten years, and the likelihood of funding any of these letters of credit is considered to be remote. The Bank holds collateral supporting those commitments. The Bank also has letters of credit with the North Dakota Public Finance Authority (NDPFA) with maturities ranging from 11 months to 22 years. If the letters issued to the NDPFA were ever drawn upon, the NDPFA is legally obligated to reimburse the Bank from funds legally available, or from any appropriation made available from the Legislative Assembly after certification by the Industrial Commission. The likelihood of funding any of these letters of credit is also considered to be remote. Outstanding issued letters of credit as of December 31, 2023 and 2022 were \$27,278 and \$27,278, respectively.

Confirming letters of credit are issued to North Dakota financial institutions to support letters of credit they have issued but are still in need of backing from an institution with a long-term, high quality bond rating. In the event these letters were to be drawn upon, based on the terms of the agreement, the Bank would immediately withdraw funds from the institution's correspondent bank account held at the Bank to cover the amount drawn. These agreements generally have terms of 12 months or less. The likelihood of funding any of these confirming letters of credit is also considered to be remote. Outstanding issued confirming letters of credit as of December 31, 2023 and 2022 were \$5,584 and \$4,110, respectively.

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Letters of credit pledged for public deposits to North Dakota financial institutions are issued to support public borrowing arrangements. These letters are fully collateralized by a pool of loans pledged to the Bank. These agreements generally have terms of 12 months or less. Financial standby letters for public deposits by North Dakota banks totaled \$572,975 and \$369,095 as of December 31, 2023 and 2022, respectively. The likelihood of funding any of these letters of credit is also considered to be remote. These letters of credit are an authorized form of collateral for public deposits per North Dakota Century Code 21-04-09.

The Bank has not recorded a contingent liability related to off-balance sheet activity as of December 31, 2023 and 2022.

NOTE 15 - INTEREST RATE SWAP CONTRACTS

Interest rate swap contracts are entered into primarily as an asset/liability management strategy of the Bank to help manage its interest rate risk position. The primary risk associated with all swaps is the exposure to movements in interest rates and the ability of the counterparties to meet the terms of the contract. The Bank is exposed to losses if the counterparty fails to make its payments under a contract in which the Bank is in a receiving status. The Bank minimizes its risk by monitoring the credit standing of the counterparties. The Bank anticipates the counterparties will be able to fully satisfy their obligations under the remaining agreements. These contracts are typically designated as cash flow hedges.

The Bank has outstanding interest rate swap agreements with a notional amount totaling \$500,000 and \$545,000 as of December 31, 2023 and 2022, respectively, to convert variable rate federal funds and variable rate LIBOR-indexed deposits into fixed-rate instruments over the term of the contracts. The notional amount of the interest rate swaps does not represent amounts exchanged by the parties. The amount exchanged is determined by reference to the notional amount and other terms of the individual interest rate swap agreements. These cash flow hedges were determined to be fully effective during all periods presented. The Bank expects the hedges to remain fully effective during the remaining terms of the swaps.

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The following table summarizes the derivative financial instruments utilized as of December 31, 2023:

	Balance sheet location	Notional amount	Estimated fair value	
			Gain	Loss
Cash flow hedge	Other assets	\$ 50,000	\$ 4,126	
Cash flow hedge	Other assets	\$ 50,000	\$ 3,562	
Cash flow hedge	Other assets	\$ 50,000	\$ 3,453	
Cash flow hedge	Other assets	\$ 50,000	\$ 4,390	
Cash flow hedge	Other assets	\$ 50,000	\$ 10,053	
Cash flow hedge	Other assets	\$ 50,000	\$ 9,046	
Cash flow hedge	Other assets	\$ 50,000	\$ 4,175	
Cash flow hedge	Other assets	\$ 50,000	\$ 1,347	
Cash flow hedge	Other assets	\$ 50,000	\$ 6,878	
Cash flow hedge	Other assets	\$ 50,000	\$ 5,096	

The following table details the derivative financial instruments, the remaining maturities, and the interest rates being paid and received as of December 31, 2023:

	Notional value	Maturity (years)	Fair value gain/(loss)	Interest rates	
				Receive	Pay
Interest rate swap	\$ 50,000	5.4	\$ 1,347	5.33%	2.86%
Interest rate swap	\$ 50,000	6.3	\$ 4,175	5.33%	1.92%
Interest rate swap	\$ 50,000	7.7	\$ 6,878	5.46%	1.48%
Interest rate swap	\$ 50,000	8.3	\$ 4,126	5.46%	2.39%
Interest rate swap	\$ 50,000	8.5	\$ 5,096	5.33%	1.99%
Interest rate swap	\$ 50,000	9.3	\$ 3,562	5.33%	2.47%
Interest rate swap	\$ 50,000	9.5	\$ 3,453	5.33%	2.52%
Interest rate swap	\$ 50,000	10.3	\$ 4,390	5.33%	2.36%
Interest rate swap	\$ 50,000	10.8	\$ 10,053	5.33%	1.15%
Interest rate swap	\$ 50,000	10.8	\$ 9,046	5.33%	1.38%

Amongst all swap counterparties for the transactions noted above, the Bank holds a net \$51,500 in cash pledged under collateral arrangements related to the interest rate swaps as of December 31, 2023, to satisfy the collateral requirements.

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NOTES TO FINANCIAL STATEMENTS
DECEMBER 31, 2023 AND 2022
(In Thousands)

The following table summarizes the derivative financial instrument utilized as of December 31, 2022:

	Balance sheet location	Notional amount	Estimated fair value	
			Gain	Loss
Cash flow hedge	Other assets	\$ 50,000	\$ 4,852	
Cash flow hedge	Other assets	\$ 50,000	\$ 4,440	
Cash flow hedge	Other assets	\$ 50,000	\$ 4,313	
Cash flow hedge	Other assets	\$ 50,000	\$ 5,284	
Cash flow hedge	Other assets	\$ 50,000	\$ 11,311	
Cash flow hedge	Other assets	\$ 50,000	\$ 10,228	
Cash flow hedge	Other assets	\$ 45,000	\$ 1,161	
Cash flow hedge	Other assets	\$ 50,000	\$ 5,289	
Cash flow hedge	Other assets	\$ 50,000	\$ 2,101	
Cash flow hedge	Other assets	\$ 50,000	\$ 7,944	
Cash flow hedge	Other assets	\$ 50,000	\$ 6,145	

The following table details the derivative financial instruments, the remaining maturities, and the interest rates being paid and received as of December 31, 2022:

	Notional value	Maturity (years)	Fair value gain/(loss)	Receive	Pay
Interest rate swap	\$ 50,000	6.4	\$ 2,101	4.12%	2.86%
Interest rate swap	\$ 50,000	7.3	\$ 5,289	4.12%	1.92%
Interest rate swap	\$ 50,000	8.7	\$ 7,944	4.12%	1.48%
Interest rate swap	\$ 50,000	9.3	\$ 4,852	4.12%	2.39%
Interest rate swap	\$ 50,000	9.5	\$ 6,145	4.12%	1.99%
Interest rate swap	\$ 50,000	10.3	\$ 4,440	4.12%	2.47%
Interest rate swap	\$ 50,000	10.5	\$ 4,313	4.12%	2.52%
Interest rate swap	\$ 50,000	11.3	\$ 5,284	4.12%	2.36%
Interest rate swap	\$ 50,000	11.8	\$ 11,311	4.12%	1.15%
Interest rate swap	\$ 50,000	11.8	\$ 10,228	4.12%	1.38%
Interest rate swap	\$ 45,000	0.8	\$ 1,161	4.12%	1.33%

Amongst all swap counterparties for the transactions noted above, the Bank holds a net \$64,100 in cash pledged under collateral arrangements related to the interest rate swaps as of December 31, 2022, to satisfy the collateral requirements.

Continued on next page

BANK OF NORTH DAKOTA
NOTES TO FINANCIAL STATEMENTS
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(In Thousands)

Interest expense recorded on these swap transactions totaled (\$16,309) and \$1,528 as of December 31, 2023 and December 31, 2022 and is reported as a component of deposit interest expense.

NOTE 16 - FAIR VALUE OF FINANCIAL INSTRUMENTS

Fair value measurements are used to record fair value adjustments to certain assets and liabilities and to determine fair value disclosures. Available for sale debt securities are recorded at fair value on a recurring basis.

Fair Value Hierarchy

Under ASC 820-10, assets and liabilities are grouped at fair value in three levels, based on the markets in which the assets and liabilities are traded and the reliability of the assumptions used to determine fair value. These levels are:

- Level 1 – Valuation is based upon quoted prices in active markets for identical assets or liabilities that the reporting entity has the ability to access at the measurement date.
- Level 2 – Valuation is based upon quoted prices for similar assets or liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, and model-based valuation techniques for which all significant assumptions are observable in the market.
- Level 3 – Valuation is generated from model-based techniques that use significant assumptions not observable in the market. These unobservable assumptions reflect our own estimates of assumptions that market participants would use in pricing the asset or liability. Valuation techniques include use of option pricing models, discounted cash flow models and similar techniques.

Determination of Fair Value

Under ASC 820-10, fair values are based on the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. It is Bank policy to maximize the use of observable inputs and minimize the use of unobservable inputs when developing fair value measurements, in accordance with the fair value hierarchy of ASC 820-10.

The following is a description of valuation methodologies used for assets and liabilities recorded at fair value and for estimating fair value for financial instruments not recorded at fair value (ASC 825-10 disclosures).

BANK OF NORTH DAKOTA
NOTES TO FINANCIAL STATEMENTS
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(In Thousands)

Debt Securities Available for Sale

Debt securities available for sale consist primarily of Federal agencies and mortgage backed securities. Debt securities available for sale are recorded at fair value on a recurring basis. Fair value is based upon quoted prices, if available. If quoted market prices are not available, fair values are measured using observable market prices from independent pricing models, or other model-based valuation techniques such as the present value of future cash flows, adjusted for the security's credit rating, prepayment assumptions and other factors such as credit loss assumptions. Level 1 securities include those traded in an active market; examples would include U.S. Treasury securities and Agency securities. Level 2 securities as defined above would include mortgage-backed securities, collateralized mortgage obligations, and state and political subdivision securities.

Interest Rate Swap Agreements

Fair values for interest rate swap agreements are based upon the amounts required to settle the contracts.

Assets and Liabilities Recorded at Fair Value on a Recurring Basis

The tables below present the balances of assets and liabilities measured at fair value on a recurring basis as of December 31, 2023 and 2022.

	2023			
	Total	Quoted Prices in Active Markets Level 1	Significant Other Observable Inputs Level 2	Significant Unobservable Inputs Level 3
ASSETS				
Available-for-sale debt securities				
Mortgage-backed securities				
Agency	\$ 57,074	\$ -	\$ 57,074	\$ -
Collateralized mortgage obligations				
Agency	1,989,244	-	1,989,244	-
Agency bonds	335,090	335,090	-	-
U.S. treasuries	1,487,258	1,487,258	-	-
Municipal bonds	1,000	-	1,000	-
Interest rate swaps	52,126	-	52,126	-
Totals	\$ 3,921,792	\$ 1,822,348	\$ 2,099,444	\$ -
LIABILITIES				
Interest rate swap	\$ -	\$ -	\$ -	\$ -
Totals	\$ -	\$ -	\$ -	\$ -

Continued on next page

BANK OF NORTH DAKOTA
NOTES TO FINANCIAL STATEMENTS
DECEMBER 31, 2023 AND 2022
(In Thousands)

	2022			
	Total	Quoted Prices in Active Markets Level 1	Significant Other Observable Inputs Level 2	Significant Unobservable Inputs Level 3
ASSETS				
Available-for-sale debt securities				
Mortgage-backed securities				
Agency	\$ 66,966	\$ -	\$ 66,966	\$ -
Collateralized mortgage obligations				
Agency	1,911,378	-	1,911,378	-
Agency bonds	372,876	372,876	-	-
U.S. treasuries	1,955,132	1,955,132	-	-
Municipal bonds	1,000	-	1,000	-
Interest rate swaps	63,068	-	63,068	-
Totals	<u>\$ 4,370,420</u>	<u>\$ 2,328,008</u>	<u>\$ 2,042,412</u>	<u>\$ -</u>
LIABILITIES				
Interest rate swap	\$ -	\$ -	\$ -	\$ -
Totals	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>

Assets Measured at Fair Value on a Nonrecurring Basis

Under certain circumstances the Bank may make adjustments to fair value for assets and liabilities although they are not measured at fair value on an ongoing basis. The Bank only had Level 3 financial assets measured at fair value on a nonrecurring basis, which is summarized below:

	2023	2022	Valuation Technique	Unobservable Input	Range (Weighted Avg.)
Individually Evaluated Loans	\$ 31,361	\$ 93,500	Collateral valuation	Discount from market value	85%
Foreclosed Assets	\$ 4,223	\$ 4,249	Collateral valuation	Discount from market value	92%

Continued on next page

BANK OF NORTH DAKOTA
NOTES TO FINANCIAL STATEMENTS
DECEMBER 31, 2023 AND 2022
(In Thousands)

NOTE 17 - ACCUMULATED OTHER COMPREHENSIVE INCOME

The Bank recognizes and includes revenues, expenses, gains and losses in net income. Although certain changes in assets and liabilities, such as unrealized gains and losses on available for sale securities, are reported as separate component of the equity section of the balance sheet, such items, along with net income, are components of comprehensive income.

The changes in accumulated other comprehensive income by component for the years ended December 31, 2023 and 2022 follows:

	<u>Unrealized gain and losses on available-for- sale securities</u>	<u>Gains and losses on cash flow hedges</u>	<u>Total</u>
Year ended December 31, 2023			
Beginning balance	\$ (240,533)	\$ 63,068	\$ (177,465)
Other comprehensive income (loss) before reclassifications	105,398	(10,943)	94,455
Amount reclassified from accumulated other comprehensive income	-	-	-
Net current period other comprehensive income	105,398	(10,943)	94,455
Ending balance	\$ (135,135)	\$ 52,125	\$ (83,010)
	<u>Unrealized gain and losses on available-for- sale securities</u>	<u>Gains and losses on cash flow hedges</u>	<u>Total</u>
Year ended December 31, 2022			
Beginning balance	\$ 2,120	\$ (34,451)	\$ (32,331)
Other comprehensive income (loss) before reclassifications	(242,653)	97,519	(145,134)
Amount reclassified from accumulated other comprehensive income	-	-	-
Net current period other comprehensive income	(242,653)	97,519	(145,134)
Ending balance	\$ (240,533)	\$ 63,068	\$ (177,465)

Continued on next page

BANK OF NORTH DAKOTA
NOTES TO FINANCIAL STATEMENTS
DECEMBER 31, 2023 AND 2022
(In Thousands)

NOTE 18 - SUPPLEMENTAL DISCLOSURES RELATED TO STATEMENTS OF CASH FLOWS

	<u>2023</u>	<u>2022</u>
Supplemental disclosures of cash flow information		
Cash payments for:		
Interest paid to customers	\$ 94,256	\$ 29,385
Interest paid on federal funds purchased and securities sold under repurchase agreements	13,571	5,581
Interest paid on short and long-term debt	23,739	5,311
Supplemental schedule of noncash investing and financing activities		
Net change in fair value on debt securities available for sale	105,398	(242,653)
Net change in fair value on interest rate swaps	(10,943)	97,519
Transfer of ACL loans to unfunded commitments	14,196	-
Transition adjustment to undivided profits for ASC 326	3,143	-
Foreclosed assets acquired in exchange for loans	99	673

Continued on next page

BANK OF NORTH DAKOTA
NOTES TO FINANCIAL STATEMENTS
DECEMBER 31, 2023 AND 2022
(In Thousands)

NOTE 19 - REVENUE RECOGNITION

The majority of the Bank's revenues are not subject to ASC 606, including revenue generated from financial instruments, such as interest and dividend income, including loans and securities, as these activities are subject to other U.S. Generally Accepted Accounting Principles ("GAAP"). Revenue generating activities that are within the scope of ASC 606 are presented within non-interest income and are recognized as revenue as the Bank satisfies its obligation to the customer. Descriptions of revenue generating activities that are within the scope of ASC 606, which are presented in the Statements of Income as components of non-interest income and presented in the line item Service Fees and Other are as follows:

- **Gains (Losses) on Sales of Foreclosed Assets** - The Bank records a gain or loss from the sale of foreclosed assets when control of the property transfers to the buyer, which generally occurs at the time of an executed deed. When the Bank finances the sale of foreclosed asset to the buyer, the Bank assesses whether the buyer is committed to perform their obligations under the contract and whether collectability of the transaction price is probable. Once these criteria are met, the foreclosed asset is derecognized and the gain or loss on sale is recorded upon the transfer of control of the property to the buyer. In determining the gain or loss on the sale, the Bank adjusts the transaction price and related gain (loss) on sale if a significant financing component is present.
- **Service Fees and Other Charges** - The Bank provides numerous services for corresponding financial institutions and North Dakota state agencies that it earns fees and service charges from. Fees and service charges from ACH, wires, cash services, safe keeping, servicing of state funds, paying agent, trustee and escrow represent general service fees for monthly and activity-or-transaction-based fees and consist of transaction-based revenue, time-based revenue (service period), item-based revenue or some other individual attribute-based revenue. Revenue is recognized when the performance obligation is satisfied, which is generally daily for when a transaction has been completed (such as a wire transfer). Payment for such performance obligations are typically received at the time the performance obligations are satisfied.

NOTE 20 - SUBSEQUENT EVENTS

Subsequent events have been evaluated through February 7, 2024, which is the date these financial statements were available to be issued.

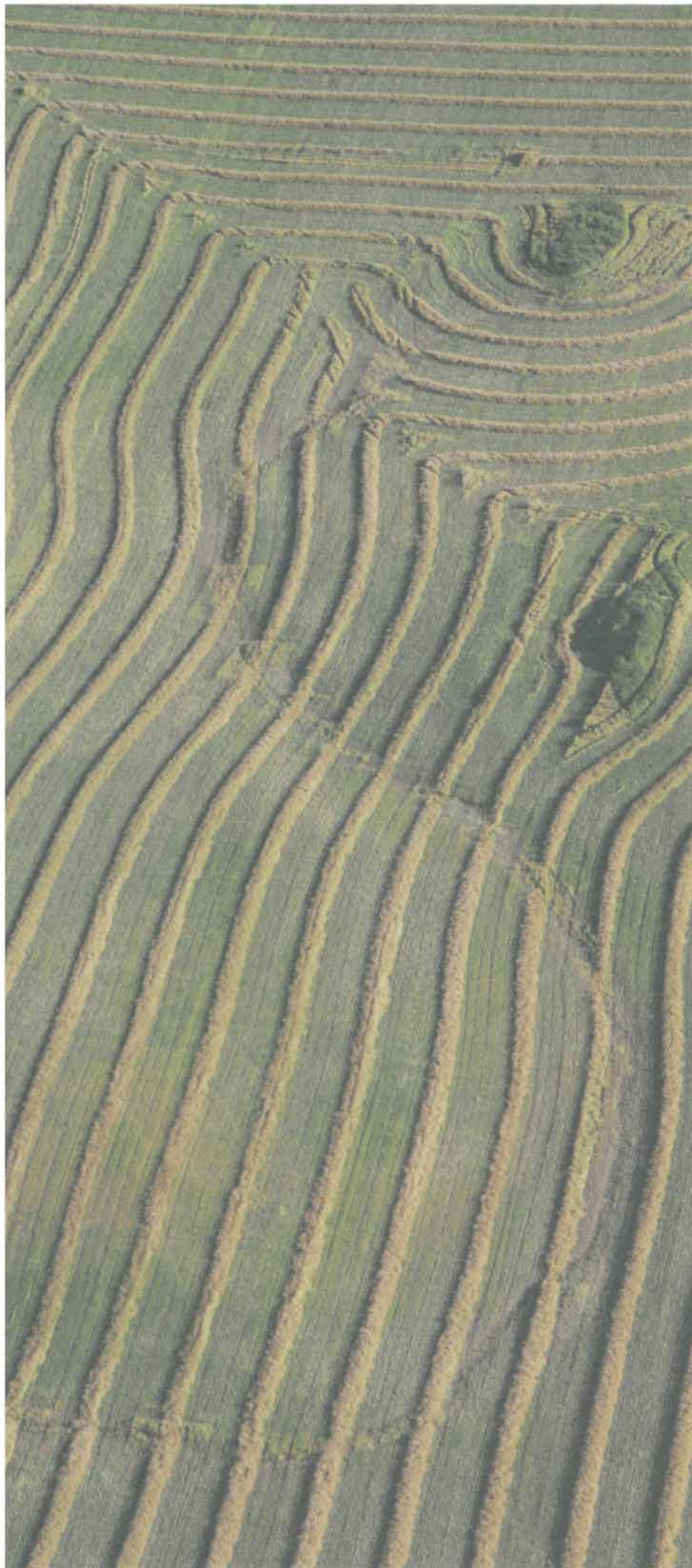


BND

Bank of North Dakota

Salute to the
past.
Addressing the
future.

ANNUAL REPORT 2023



The Cover

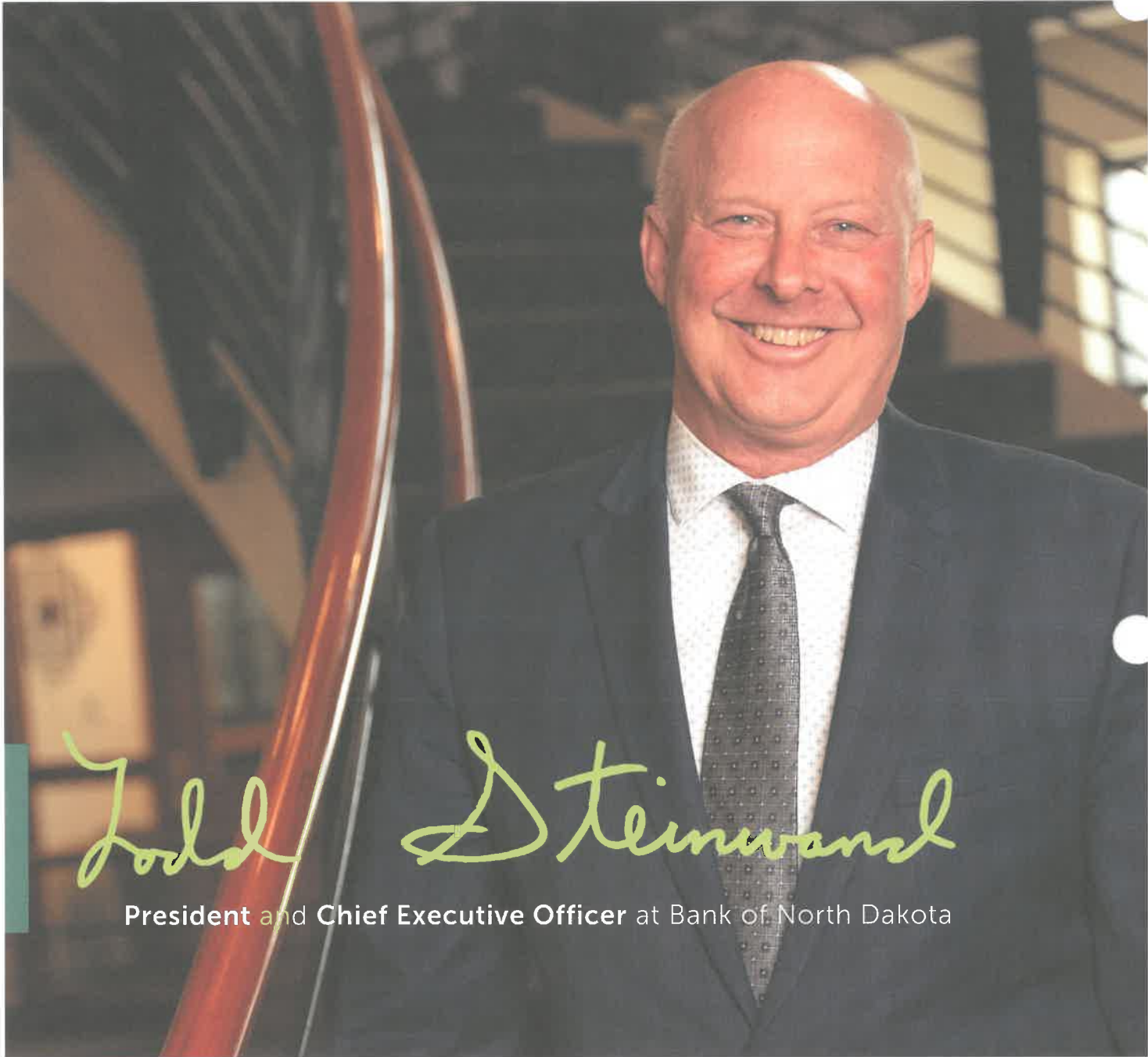
Bank of North Dakota (BND) is often referred to as a family. Our mission to “promote agriculture, commerce and industry” is more than words on a page to us. It unites us and drives us to do more for North Dakota. Every day, BND staff takes care of today, but always with a forward-looking perspective.

This year, our front cover features the children and grandchildren of some of our BND employees. Among these beautiful young faces are tomorrow’s bankers, community leaders, teachers, farmers, ranchers and entrepreneurs, just to name a few.

It is BND’s honor to be one part of cultivating a strong financial future for North Dakota, a future that will benefit the next generation and beyond.

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Todd Steinwand

President and Chief Executive Officer at Bank of North Dakota

**Salute to the past.
Addressing the future.**

Letter from the President

AT A GLANCE:

\$192.7 million
net income

\$10.1 billion
in assets

18.2% ROI

The Livestock Rebuilders Loan helped replenish cattle herds.

I am happy to report that BND had record profits in 2023 with a net income of \$192.7 million, up slightly from 2022. Our asset size was consistent with last year at \$10.1 billion. The return on investment was a healthy 18.2%. Standard & Poor's maintained BND's rating as A+/Stable in its annual review released in November, the same as in 2022.

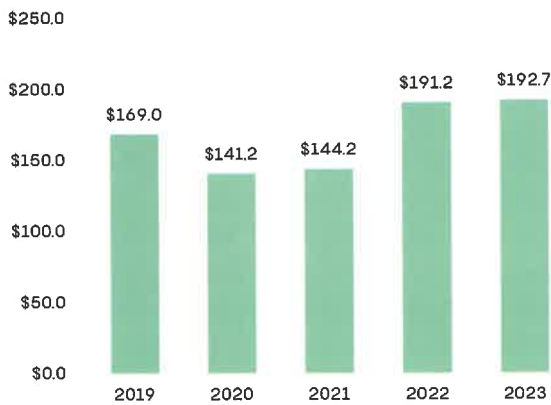
This year's annual report theme, **Salute to the Past. Addressing the Future**, is meaningful as we share this year's activities re-establishing cattle herds in the state, an important economic impact for the industry. Our past is deeply entrenched in our commitment to farm and ranch families. The front cover features some of the children and grandchildren of BND employees, young people who will benefit from the solid financial management and innovative thinking that is implemented today.

The Bank, which opened its doors in 1919, was established to provide more reasonable interest rates for ag producers than they were receiving from banks in Minneapolis and Chicago. Our commitment to them continues today. The Livestock Rebuilders Loan Program allowed ranchers to rebuild their cattle herds which were depleted by 89,000 head during the 2021 drought. It is rewarding to know we helped replenish approximately 16,000 head of cattle in our state.

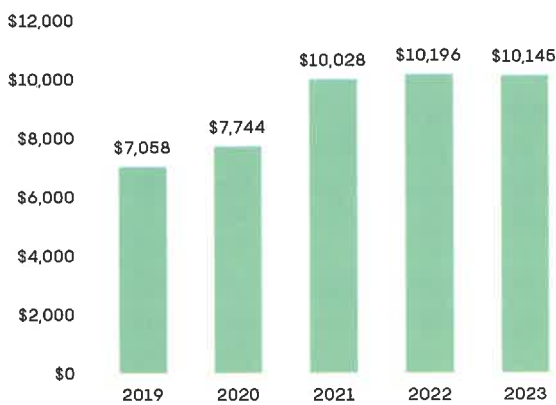
Ensuring there are opportunities for the future farmers and ranchers in our state is one of the reasons we do what we do. Our BND team members often hear from residents how BND loan programs helped keep their family farm alive during tough times or helped it expand when the opportunity was right. The homework assignment on page 12 of this report was completed by the grandson of one of our featured business owners in our 2023 Financing Economic Development report when he was in first grade.



Annual Income (in millions)



BND Assets (in millions)



Deposit Size (in millions)



Early documents established that BND would not compete with local lenders. The partnership BND has with banks and credit unions across the state is a strong contributor to our success. As a result, our total loan portfolio has grown to \$5.7 billion, with local lenders taking the lead on knowing what their communities need and accessing our programs. We expanded our Collateral Valuation Services to include commercial real estate evaluations as a service to financial institutions this year.

BND was selected by the North Dakota Legislature to lead the state's sustainability effort. North Dakota is a leader in the agriculture and energy industries. It is imperative that we recognize the demands of the marketplace so we may continue to feed and fuel the world. A group of 24 stakeholders from the public and private sector will release their first report in May 2024. North Dakota is already doing so much to meet worldwide sustainability initiatives, and it is time we let people outside our state know about it!

This year was a highly productive year for BND as we laid the foundation for years to come. The successful rollout of Dynamics One-Stop Shop (DOSS), our online loan origination system with a direct application portal, is already increasing efficiencies in the loan application process.

Our employees kicked off "A Better Way" at the end of 2023, adopting a renewed commitment to innovation. The goal is that each employee will initiate or participate in a new way of doing business that improves customer service.

Finally, this is the last BND Annual Report to be released while I serve as President and Chief Executive Officer. I'm proud that I will leave the Bank in a strong financial position when I retire mid-year, but more than that, it has been a joy to work alongside some of the most talented people I've ever known. This team understands their important role in making the lives of North Dakotans better. Bank of North Dakota is in good hands.

Remembering Eric Hardmeyer

Eric passed away February 24, 2024, surrounded by the family he loved so dearly. The lives he touched reach far and wide across the state. Eric was fiercely dedicated to making North Dakota better through his work at Bank of North Dakota. He will be remembered as a leader, visionary, mentor, innovator and strategist.

The legacy of Eric Hardmeyer will forever live on in the Hardmeyer family and the BND family.

A portrait of Eric Hardmeyer, a man with dark hair and a goatee, smiling. He is wearing a dark suit jacket, a dark blue shirt, and a blue patterned tie. The background is a dark, textured grey.

Eric Hardmeyer

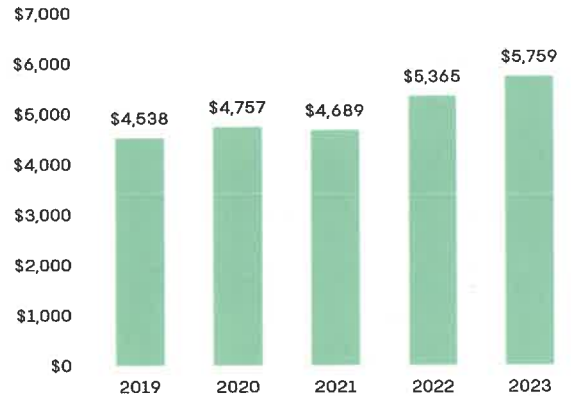
BANK OF NORTH DAKOTA PRESIDENT 2000-2021

Lending Portfolio

Total loan portfolio

The total loan portfolio grew by \$394 million to \$5.8 billion. Commercial and agriculture portfolios showed strong growth. The needs of financial institutions in North Dakota varied greatly throughout the year as some had more liquidity than needed, and others experienced the opposite. The agility of BND's loan programs helped meet those needs.

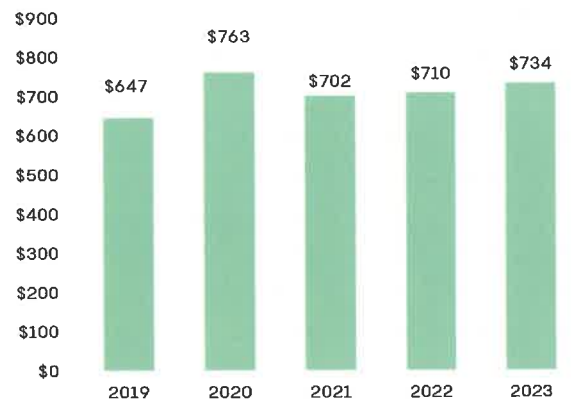
Total Loan Portfolio (in millions)



Agriculture loan portfolio

The agriculture loan portfolio increased by \$24 million with BND funding and renewing nearly \$194 million of loans. There was a slight uptick in the number of loans, but the average loan amount was lower due to higher interest rates, and land and rent expenses. The greatest number of loan originations were in the Livestock Rebuilders Program, followed by Farm & Ranch Loans.

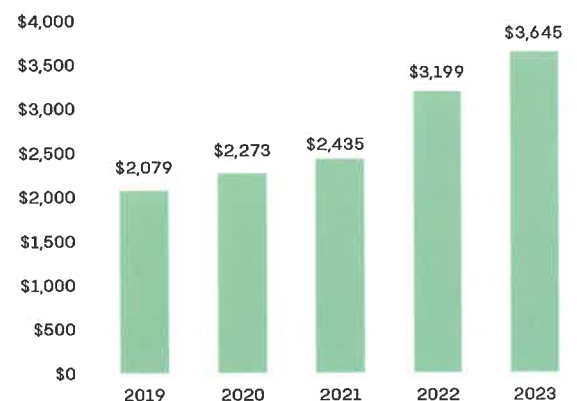
Agriculture Loan Portfolio (in millions)



Business loan portfolio

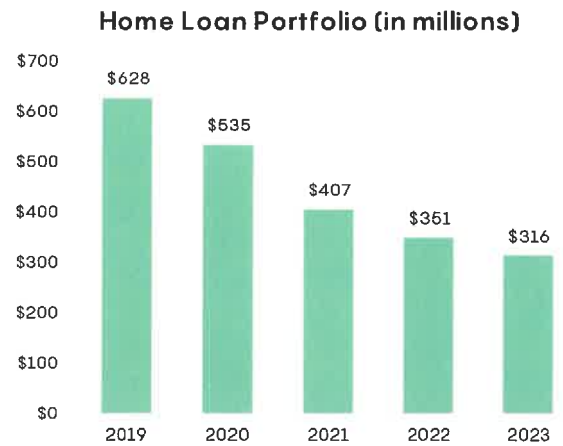
The business loan portfolio increased by \$446 million with BND funding and renewing \$2.3 billion. Although the number of loans originated and renewed was down from the record-setting year the Bank had in 2022, the strong growth in Bank Participation and Flex PACE are good indicators for the business sector.

Business Loan Portfolio (in millions)



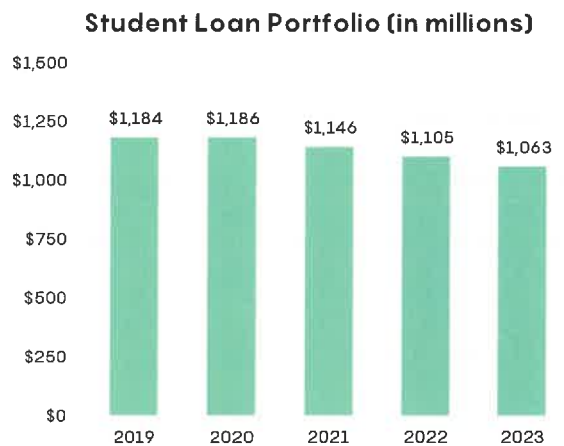
Home loan portfolio

As planned with the transfer of residential loan servicing to the North Dakota Housing Finance Agency on Oct. 1, 2021, and BND no longer originating home loans, the home loan portfolio decreased by \$35 million and will continue to decline with paydowns.



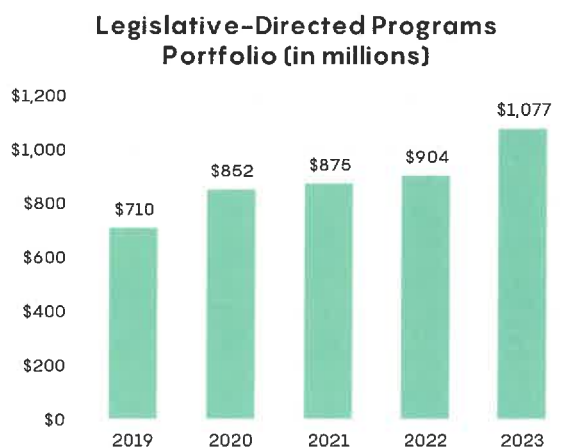
Student loan portfolio

BND student loan originations decreased by \$41 million, primarily due to far less activity with North Dakota residents utilizing the consolidation option. With potential federal student loan repayment waivers under review, it is expected to remain quiet until a decision is made. The Bank disbursed \$69 million in loans in 2023.

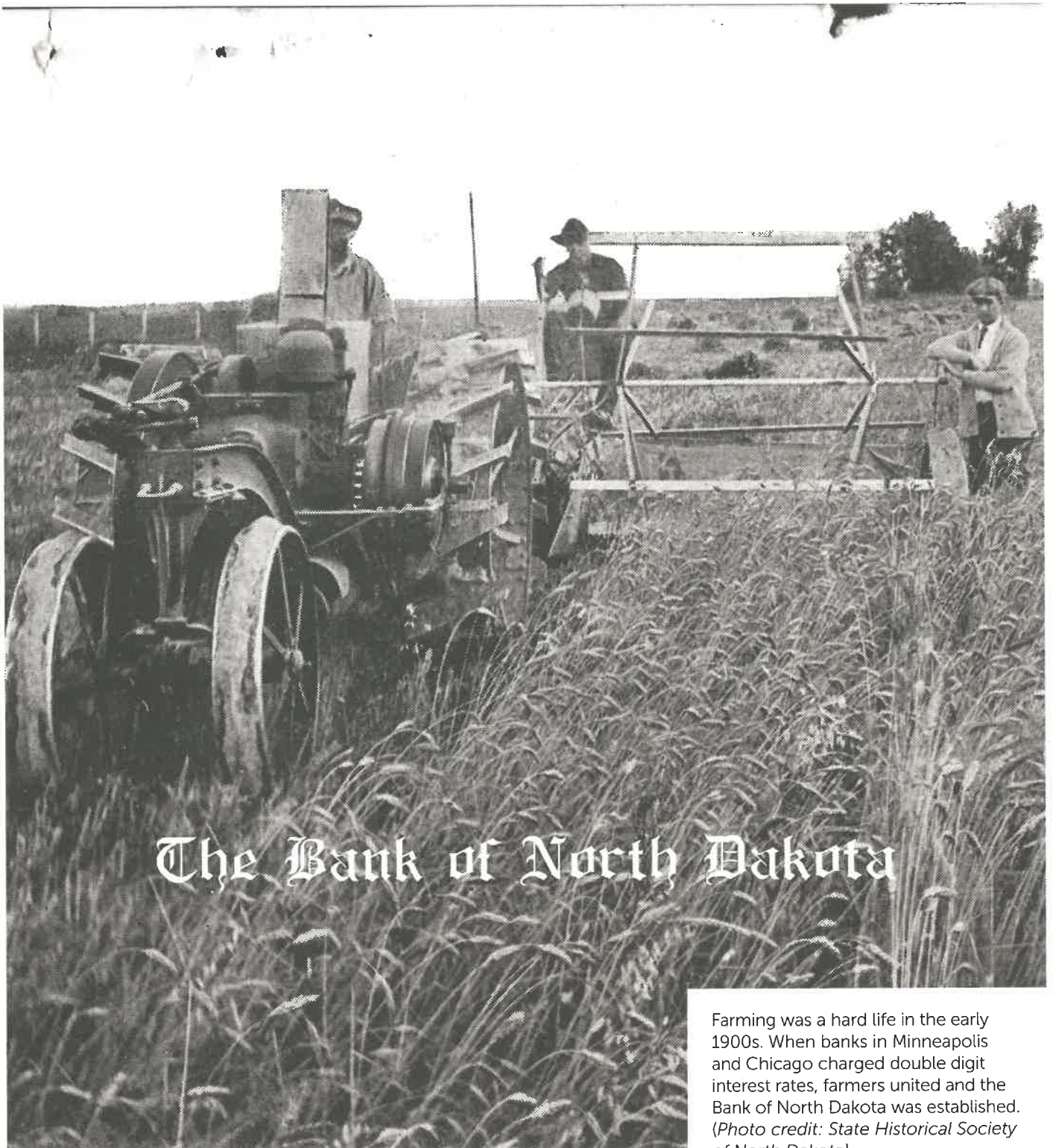


Legislative-directed programs portfolio

BND administered just over \$1 billion in assets in legislative-directed programs, an increase of \$173 million since 2022 and an increase of \$367 million in five years. These programs serve a wide range of purposes including school construction, water projects, general and medical infrastructure.



Salute to the Past



The Bank of North Dakota

Farming was a hard life in the early 1900s. When banks in Minneapolis and Chicago charged double digit interest rates, farmers united and the Bank of North Dakota was established. (Photo credit: State Historical Society of North Dakota)

Honoring our Roots: Agriculture and Bank of North Dakota

If you lived in North Dakota in 1919, it is likely that you made your living as a farmer or rancher, or in a profession that supported farmers and ranchers. There wasn't a great deal of economic diversity at the time.

When you put your grain on the railway to be delivered to an elevator in Minneapolis/St. Paul, you were given the most broken-down of the railcars, causing tons of grain to be lost along the way. You were paid for the grain that arrived in the Twin Cities, not the amount of grain you loaded in North Dakota. You weren't present when they tested your grain so you needed to rely on the elevator's assessment, often thought to be more favorable to the elevator than the farmer.

When a loan was needed, it most likely came from a bank in Minneapolis or Chicago, with interest rates in the double digits. It was unaffordable for most agriculture producers, and they barely squeaked by.

This set the stage for the Nonpartisan League to come into power, and as part of its platform, the 1919 North Dakota Legislature created the State Mill and Elevator, Workforce Safety Insurance, and Bank of North Dakota,

BND encouraged farmers to stay on the land and do their best to make a living.

along with the Industrial Commission to oversee them. North Dakota tax dollars would be used to support North Dakota residents. While it wasn't the first or only state-owned bank to be created, it is the only one that has survived the test of time.

The first test of the relationship between BND and the agriculture community came with the Great Depression when drought turned the richest soil to



Bank of North Dakota moved to this location on the corner of Seventh Street and Main Avenue in Bismarck shortly after it was voted into law. (Photo credit: State Historical Society of North Dakota)

dust. At the time, BND held most of the farm loans in the state, and although they could not forgive the loans, they encouraged farmers to stay on the land and do their best to make a living. Their reward for doing so was that they were allowed to buy back their land after the Depression, keeping the family farm in the family.

When troops returned from World War II, the foreclosed land was made available for purchase to them if the original owner declined.

Bank of North Dakota offered its first disaster relief loan during the Red River Valley flood in 1997. Several years later in 2002, farmers were hit with drought and the strategy to expand disaster relief to the ag sector was born. Since the Financial Assistance Program Loan in that year, BND has responded to weather-related events that negatively impacted farmers and ranchers nine more times.

2023 Livestock Disaster Relief Program Results

The most recent use of BND funds for disaster relief was after the 2021 drought when beef cow numbers decreased by 89,000 head. The program closed in June 2023.

The drought created hay shortages, forcing producers to purchase and transport hay from other states. A statewide drought disaster was declared.

The Livestock Rebuilders Loan Program was part of a suite of programs rolled out by the state including the Emergency Feed Transportation Assistance Program, administered by the North Dakota Department of Agriculture, and the Livestock Drought Loan Program, administered by BND.

As with all previous disaster relief loans, local banks and credit unions serve as the loan program conduit for BND programs. For this effort, 32 different financial institutions, and a total of 56 branches within them, accessed the program for their customers. There were 190 loans made for a total loan amount of \$25,850,471, of which BND funded \$16,721,788. Approximately 16,000 head of cattle were replenished in the state with the assistance of the Livestock Rebuilders Loan Program.

The loan was available for up to a seven-year term with a fixed interest rate of 3.50%.

“The state’s response to the 2021 drought is an example of what makes North Dakota so successful,” said members of the Industrial Commission in a joint statement. The Commission, consisting of Gov. Doug Burgum as chairman, Attorney General Drew Wrigley, and Agriculture Commissioner Doug Goehring, oversees BND.

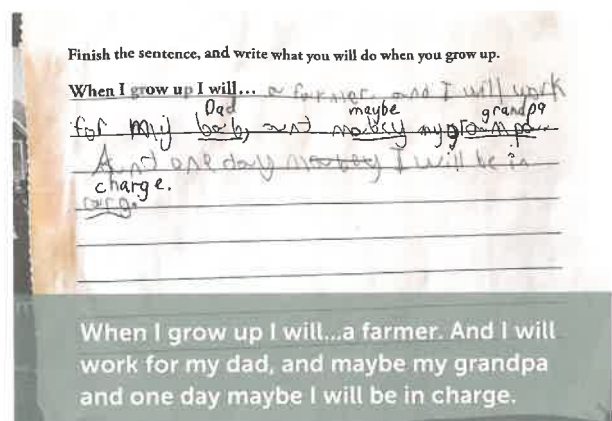
“We are able to work with key stakeholders who determine needs and state agencies that work together to respond quickly, and that sets us apart from so many others.”



Brandon Enger, a third-generation operator of Enger Grain and Livestock, walks through his family’s cattle barn in Marion, North Dakota.

Thoughts from a young North Dakotan

One of the business owners featured in BND’s Financing Economic Development report shared this school assignment completed by their grandson who was in the first grade. The Bank’s commitment to partnering with local banks and credit unions to finance the agriculture industry in North Dakota gives this young person a greater chance to achieve this dream.



When I grow up I will...a farmer. And I will work for my dad, and maybe my grandpa and one day maybe I will be in charge.

Addressing the Future



Today, drones are one aspect of technology used to monitor soil, count livestock and monitor their movement, focus crop spraying, and sample soil and water.

Dynamics One-Stop Shop Debuts

Dynamics One-Stop Shop (DOSS) is a BND initiative utilizing Microsoft Dynamics to change the way we do business. Started in October 2020 with a series of meetings to define opportunities where the Bank could improve customer service through technology, the project officially kicked off 13 months later.

The system went live internally in November 2022, and the customer portal was released in 2023 after a trial period with several financial institutions. The completely custom system includes 138 cloud flows and 126 processes. Initial results have already shown increased efficiencies. For example, approximately 20 minutes is saved per loan boarding due to automation. This

translates into quicker turnaround times for financial institutions and employee time savings.

The first phase of the project includes loan application management, loan servicing document generation, direct application portal, interactive portal for participation loan financial institutions, vault inventory management, and other processes.

The DOSS team consisted of 52 Bank employees. Since the first day of kickoff, it took just over 11,000 hours to build the system. Currently, it is impacting the work processes of two-thirds of the Bank's staff, with plans to integrate more fully over the next several years.

Members of the BND Business Development Team review a new loan application. L to R: Craig Hanson, Senior VP of Lending; Lindsay Wagner, Loan Administration Manager; and Business Bankers Kaylen Hausauer and Bruce Schumacher.



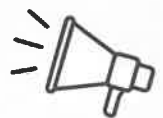
Collateral Valuation Services Expands Offerings

Bank of North Dakota is responding to the needs of financial institutions by offering collateral valuation services that include ag real estate or chattel evaluations and appraisal reviews for ag and commercial real estate. In 2023, it expanded to include commercial real estate evaluation services.

The service was initiated at the request of the North Dakota Bankers Association and Independent Community Banks of North Dakota due to the lack of independent providers in the state.

BND's collateral valuation expertise and quick turnaround time helps local lenders serve their customers better.

Since offering the service in early 2022, the feedback from local financial institutions has been positive:



I couldn't be happier with the turnaround time and quality of work performed!

We just got our first appraisal review back. Thanks for completing that so quickly! You guys did a fantastic job.

I was very impressed with the reports this team has produced.



Sustainability Initiative for North Dakota Moves Forward

North Dakota's common-sense approach to sustainability reflects a blend of political ideology, economic targets, conservation priorities and concerns about federal regulatory overreach. In an effort to comprehend the influence of a global movement driven by the financial and investment industries known as Environmental, Social and Governance (ESG), the 68th Legislative Assembly enacted House Bill 1429 directing Bank of North Dakota (BND), the sole state-owned bank in the United States, to lead a comprehensive statewide ESG study. Throughout this initiative there was a clear understanding that North Dakota is not stepping back from its commitment to the state's two largest industries, energy and agriculture.

Over the past year, BND has collaborated with stakeholders representing government, private industry and associations to create a dynamic report outlining industry-specific strategies. The object is to identify immediate and long-

term strategies to strengthen the state's economy and enhance the quality of life for its citizens. These strategies will create a blueprint that demonstrates how transformation and innovation can thrive in a world focused on carbon management.

In the U.S., North Dakota ranks sixth for total energy production and 11th for agricultural exports, totaling more than \$8.5 billion in exported goods and services to over 190 countries. North Dakota has a unique story to tell about its economy and commitment to environmental stewardship. Moving forward, BND in cooperation with numerous stakeholders, will launch STAND (Sustain, Transform, and Authenticate North Dakota), a digital platform to shape a comprehensive and compelling narrative about North Dakota's initiatives and values as a leader in agriculture and energy production, feeding and fueling the world.



North Dakota's economic drivers, energy and agriculture, are formulating industry-specific strategies that align sustainability with resilience to address evolving global expectations.

A Better Way Drives Innovation

From the beginning, Bank of North Dakota has been an innovator. When its operating principles were established in 1919, state officials knew that it wouldn't prosper if it competed with other banks in the state. Its unique approach of partnering with the state's financial institutions rather than competing with them is a foundation for the Bank's success today.

BND hasn't forgotten its roots and is committed to instilling the drive for innovation throughout the organization. Two times per year, the Bank brings together all its employees for in-person meetings to ensure the strong culture of collaboration continues to grow, and to create strategic direction.

At the October all-employee meeting, the Executive Committee unveiled the "A Better Way" initiative, a challenge for the team to take collaboration and innovation to the next level. Departments identified opportunities in special working sessions and began implementing new ideas almost immediately. They continue to refine and find new ways to improve both internal and external customer service.

Two times per month, Innovation Team members lead virtual "A Better Way Conversations" with staff, showcasing how BND employees have utilized different technologies and processes to improve workflows. This stimulates new efficiencies and connects both on-site and off-site team members in a meaningful way.

The effort has rejuvenated the team and is leading them to proactively create new solutions that utilize technology, streamline workflows, and increase collaboration between areas.

Top BND President and CEO Todd Steinwand addresses the staff during the October all-employee event. **Bottom** BND team members from three separate areas visit, L to R: Kirby Evanger, Senior VP of Credit Administration; Nick Leintz, Internal Audit Manager; and Tyler Giffey, Education Market Leader of Quality Assurance.



Aerial view of North Dakota's State Capitol building and campus.

BND Leadership Team

BND is overseen by the North Dakota Industrial Commission. The governor appoints an advisory board of directors which consists of banking and business leaders who advise the Industrial Commission and BND on state trends. The Industrial Commission appoints the Bank president who hires the Executive Committee members.

The BND Advisory Board consists of three subcommittees which assist the Board and Industrial Commission in fulfilling their oversight responsibilities to ensure the safety and soundness of the Bank. These committees are Finance and Credit, Audit and Risk Management, and Leadership Development and Compensation.

ND Industrial Commission



Doug Burgum
Governor



Drew H. Wrigley
Attorney General



Doug Goehring
Agriculture Commissioner

BND Advisory Board



Karl Bollingberg
Chairman of the Board



Dennis Johnson
Board Member



Jean Voorhees
Board Member



Pat Clement
Board Member



Christie Obenauer
Board Member



Bill Price
Board Member



Brenda Foster
Board Member

BND Executive Committee



Todd Steinwand
President/CEO



Alison Anderson
Chief Banking &
Innovation Officer



Kirby Evanger
Chief Credit Officer



Craig Hanson
Chief Lending Officer



Kelvin Hullet
Chief Business
Development Officer



Lori Leingang
Chief Administrative Officer



Rob Pfennig
Chief Financial Officer



Christy Steffenhagen
Chief Risk Officer

Ending Balance Sheets

Bank of North Dakota
 Years Ended December 2023 and 2022
 (In thousands)

	2023	2022
Assets		
Cash and due from banks	\$ 402,587	\$ 405,718
Federal funds sold	37,470	44,605
Securities	3,876,909	4,344,352
Loans		
Commercial	3,644,897	3,199,277
Agriculture	734,237	709,866
Residential	316,153	351,076
Student	1,063,453	1,104,408
Total Loans	5,758,740	5,364,627
Less Allowance for Loan Loss	(99,865)	(108,752)
Total Loans Less Allowance	5,658,875	5,255,875
Other Assets	168,787	145,265
Total Assets	<u>\$ 10,144,628</u>	<u>\$ 10,195,815</u>
Liabilities and Equity		
Deposits		
Noninterest Bearing	\$ 664,010	\$ 632,498
Interest Bearing	8,045,138	7,679,449
Total Deposits	8,709,148	8,311,947
Federal Funds Purchased and Repurchase Agreements	323,010	205,845
Short- and Long-term Borrowings	25,000	675,000
Other Liabilities	28,183	5,835
Total Liabilities	9,085,341	9,198,627
Equity	1,059,287	997,188
Total Liabilities and Equity	<u>\$ 10,144,628</u>	<u>\$ 10,195,815</u>

Ending Income Statements

Bank of North Dakota
Years Ended December 2023 and 2022
(In thousands)

	2023	2022
Interest Income	\$ 365,213	\$ 260,591
Interest Expense	(137,201)	(40,882)
Net Interest Income	228,012	219,709
Provision for Loan Losses	(7,507)	-
Net Interest Income After Provision	220,505	219,709
Noninterest Income	6,697	4,751
Noninterest Expense		
Salaries and Benefits	(19,564)	(17,547)
Data Processing	(7,466)	(7,354)
Long-term debt prepayment fee	-	(1,171)
Occupancy and Equipment	(828)	(752)
Other Operating Expenses	(6,605)	(6,486)
Total Noninterest Expense	(34,463)	(33,310)
Net Income	192,739	191,150

View a complete copy of the Audited Financial Statements at
bnd.nd.gov/annual-report.

Ten-Year Summary

Bank of North Dakota | December 31, 2014-2023

	2023	2022	2021	2020
Operating results (in thousands)				
Interest income	\$365,213	\$260,591	\$204,457	\$225,479
Interest expense	137,201	40,882	28,921	41,018
Net interest income	228,012	219,709	175,536	184,461
Provision for loan losses	7,507	-	4,750	16,800
Net interest income after provision for loan losses	220,505	219,709	170,786	167,661
Noninterest income	6,697	4,751	6,381	4,603
Noninterest expense	34,463	33,310	32,996	31,063
Net income	192,739	191,150	144,171	141,201
Payments to general fund	140,000	-	35,000	70,000
Payments to other funds	88,238	30,397	39,605	67,550
Balance sheet (in thousands)				
Total assets - year end	10,144,628	10,195,815	10,028,128	7,744,319
Federal funds sold and resell agreements	37,470	44,605	4,450	10,000
Securities	3,876,909	4,344,352	2,600,007	1,849,609
Loans	5,758,740	5,364,627	4,688,820	4,756,542
Agricultural	734,237	709,866	701,768	762,809
Business	3,644,897	3,199,277	2,434,765	2,272,999
Residential	316,153	351,076	406,565	535,098
Student	1,063,453	1,104,408	1,145,722	1,185,636
Deposits	8,709,148	8,311,947	8,133,894	5,795,472
Noninterest bearing	664,010	632,498	765,200	750,741
Interest bearing	8,045,138	7,679,449	7,368,694	5,044,731
Federal funds purchased and repurchase agreements	323,010	205,845	763,250	775,005
Short- and long-term debt	25,000	675,000	108,000	186,010
Equity	1,059,287	997,188	981,569	912,904
Capital	2,000	2,000	2,000	2,000
Capital surplus	72,000	72,000	72,000	72,000
Undivided profits	1,068,297	1,100,653	939,900	870,333
Accumulated other comprehensive income (loss)	(83,010)	(177,465)	(32,331)	(31,429)

2019	2018	2017	2016	2015	2014
\$263,738	\$240,002	\$219,700	\$210,803	\$194,298	\$174,584
58,515	46,442	37,865	33,975	32,164	31,455
205,223	193,560	181,835	176,828	162,134	143,129
6,000	12,000	12,000	16,000	12,500	8,000
199,223	181,560	169,835	160,828	149,634	135,129
6,916	7,170	6,335	6,323	7,688	7,987
37,090	30,222	30,886	30,996	26,668	32,157
169,049	158,508	145,284	136,155	130,654	110,959
35,000	70,000	170,000	-	-	-
45,109	58,614	16,932	19,989	28,645	17,345
7,058,432	7,015,834	7,003,302	7,295,268	7,407,942	7,215,687
10,685	39,465	57,555	63,070	77,905	42,105
2,016,126	1,912,743	1,665,252	2,068,327	2,657,527	2,933,570
4,537,943	4,584,233	4,909,278	4,789,553	4,339,618	3,852,155
647,108	665,691	668,904	687,486	513,899	436,970
2,078,573	2,039,833	2,071,953	1,982,625	1,811,259	1,559,137
628,319	694,577	762,480	739,412	693,712	652,076
1,183,943	1,184,132	1,405,941	1,380,030	1,320,748	1,203,972
5,089,092	4,769,819	4,604,958	4,887,192	5,802,142	5,730,611
628,256	567,352	555,020	663,156	641,264	700,446
4,460,836	4,202,467	4,049,938	4,224,036	5,160,878	5,030,165
365,335	271,505	299,775	242,480	119,500	178,455
631,030	1,103,436	1,263,569	1,280,538	727,322	645,126
939,028	861,884	824,802	875,732	749,493	652,134
2,000	2,000	2,000	2,000	2,000	2,000
72,000	72,000	72,000	72,000	72,000	72,000
866,682	777,742	747,848	789,496	673,330	571,276
(1,654)	10,142	2,954	12,236	2,163	6,858



Bank of North Dakota

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bnd.nd.gov

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**BANK OF NORTH DAKOTA
FINANCE AND CREDIT COMMITTEE TELECONFERENCE
NONCONFIDENTIAL MINUTES
Wednesday, March 20, 2024 – 1:00 p.m. CT**

MEMEBRS PRESENT

VIA PHONE: Christy Obenauer, Acting Chairman
Bill Price

MEMBERS ABSENT: Brenda Foster

ALSO PRESENT

VIA PHONE: Sara Schumacher, BND
Rob Pfennig, BND
Kirby Evanger, BND
Craig Hanson, BND
Kim Swenson, BND
Mike Morey, BND
Rod Heit, BND
Tyson Zeltinger, BND
Gus Staahl, BND
Nicole Koons, BND

Acting Chairman Obenauer called the meeting to order at 1:00 p.m.

Acting Chairman Obenauer adjourned the nonconfidential portion of the meeting at 1:00 p.m. and the Advisory Board went into Executive Session pursuant to N.D.C.C. 6-09-35 to discuss those items on the agenda under Bank of North Dakota Confidential Business.

The Executive Session began at 1:00 p.m. and was attended by Christy Obenauer, Bill Price, Sara Schumacher, Rob Pfennig, Kirby Evanger, Craig Hanson, Rod Heit, Tyson Zeltinger, Gus Staahl, Nicole Koons

The following items were considered during Executive Session:

- Recommendations of Loan Amendments to the Advisory Board Committee
- Recommendations of Loan Applications to the Advisory Board Committee
- Problem Loan as of 02/29/2024

The Executive Session adjourned at 2:41 p.m.

Acting Chairman Obenauer reconvened the Nonconfidential portion of the meeting.

Summary of Recommendations (Confidential Session):

- A recommendation will be made to the Advisory Board Committee to approve the loan amendment 1 as presented.
- A recommendation will be made to the Advisory Board Committee to approve the loan application 1 as presented.

Kirby Evanger presented amendments to General Loan Policy. A recommendation will be made to the Advisory Board Committee to approve the amendments as presented.

Rob Pfennig presented the February 2024 Monthly Financial Summary.

Mike Morey presented the Stress Testing Results.

NONCONFIDENTIAL FINANCE AND CREDIT COMMITTEE MEETING MINUTES

Wednesday, March 20, 2024

Kim Swenson presented the 2023 Loan Guideline and Policy Exception Rates.

The next Advisory Board Finance and Credit Committee meeting will be held Wednesday, April 17, 2024.

Being no further Bank of North Dakota business, Acting Chairman Obenauer adjourned the nonconfidential portion of the meeting at 3:15 p.m.

Sara Schumacher, Executive Assistant

**BANK OF NORTH DAKOTA
ADVISORY BOARD TELECONFERENCE
NON-CONFIDENTIAL MINUTES
Thursday, March 21, 2024 – 8:30 a.m. CT**

MEMBERS PRESENT

VIA PHONE:

Karl Bollingberg, Chairman
Dennis Johnson, Vice Chairman
Pat Clement
Christie Obenauer
Jean Voorhees
Bill Price

MEMBERS ABSENT:

Brenda Foster

ALSO PRESENT:

Todd Steinwand, BND
Sara Schumacher, BND
Rob Pfennig, BND
Kirby Evanger, BND
Christy Steffenhagen, BND
Kelvin Hullet, BND
Craig Hanson, BND

ALSO PRESENT

VIA PHONE:

Lori Leingang, BND
Mike Morey, BND
Karen Tyler, Industrial Commission

Chairman Bollingberg called the meeting to order at 8:30 a.m.

Chairman Petersen adjourned the nonconfidential portion of the meeting at 8:30 a.m. and the Advisory Board went into Executive Session pursuant to N.D.C.C. 6-09-35 to discuss those items on the agenda under Bank of North Dakota Confidential Business.

The Executive Session began at 8:30 a.m. and was attended by Karl Bollingberg, Dennis Johnson, Pat Clement, Christie Obenauer, Jean Voorhees, Bill Price, Todd Steinwand, Sara Schumacher, Rob Pfennig, Kirby Evanger, Lori Leingang, Christy Steffenhagen, Kelvin Hullet, Craig Hanson, Karen Tyler

The following items were considered during Executive Session:

- Recommendation of Loan Amendments to the Bank of North Dakota
- Recommendation of Loan Applications to the Bank of North Dakota
- Finance and Credit Committee Reports Recap
- Confidential Finance and Credit Committee Minutes (February 21, 2024)
- Confidential Advisory Board Minutes (February 22, 2024)
- Confidential Investment Committee Minutes (February 07, 14, 21, 23, 28, 2024)

The Executive Session adjourned at 9:00 a.m.

Chairman Petersen reconvened the Nonconfidential portion of the meeting.

Summary of Recommendations (Confidential Session):

- A motion was made by Ms. Obenauer to approve the amendment 1 as presented. Seconded by Mr. Price. Members Bollingberg, Johnson, Clement, Obenauer, Voorhees, Price voted aye. Motion carried.
- A motion was made by Ms. Obenauer to approve the application 1 as presented. Seconded by

NONCONFIDENTIAL ADVISORY BOARD MINUTES
Thursday, March 21, 2024

Mr. Price. Members Bollingberg, Johnson, Clement, Obenauer, Voorhees, Price voted aye. Motion carried.

- A motion was made by Ms. Obenauer to approve the consent agenda as presented. Seconded by Ms. Voorhees. Members Bollingberg, Johnson, Clement, Obenauer, Voorhees, Price voted aye. Motion carried.

Finance and Credit Committee made a recommendation to approve the amendments to the General Loan Policy. A motion was made by Ms. Obenauer. Seconded by Mr. Price. Members Bollingberg, Johnson, Clement, Obenauer, Voorhees, Price voted aye. Motion carried.

Christie Obenauer provided a Finance and Credit Committee Reports Recap for Brenda Foster.

A DFI Capital Plan requests discussion was held.

Consent Agenda:

- Nonconfidential Finance and Credit Committee Minutes (February 21, 2024)
- Nonconfidential Leadership Development and Compensation Committee Minutes (February 22, 2024)
- Nonconfidential Advisory Board Minutes (February 22, 2024)
- Nonconfidential Investment Committee Minutes (February 07, 14, 21, 23, 28, 2024)

A motion was made by Mr. Johnson to approve the consent agenda as presented. Seconded by Ms. Clement. Members Bollingberg, Johnson, Clement, Obenauer, Voorhees, Price voted aye. Motion carried.

BND Advisory Board Members presented a report of activity in their region of ND.

An Advisory Board Discussion was held.

The next Advisory Board meetings will be held:

- Finance and Credit Committee Meeting – Wednesday, April 17, 2024, 1:00 p.m., Teleconference
- Audit and Risk Committee Meeting – Thursday, April 18, 2024, 8:30 a.m., 3rd Floor Missouri River Room 301
- Group Advisory Board Meeting – Thursday, April 18, 2024, 1:00 p.m. 3rd Floor Missouri River Room 301

Being no further Bank of North Dakota business, Chairman Bollingberg adjourned the nonconfidential portion of the meeting at 10:40 a.m.

Sara Schumacher, Executive Assistant

GEOLOGICAL SURVEY QUARTERLY REPORT

*January 1, 2024 to March 31, 2024
to the*

NORTH DAKOTA INDUSTRIAL COMMISSION

Edward C. Murphy
State Geologist
Geological Survey
Department of Mineral Resources
North Dakota Industrial Commission

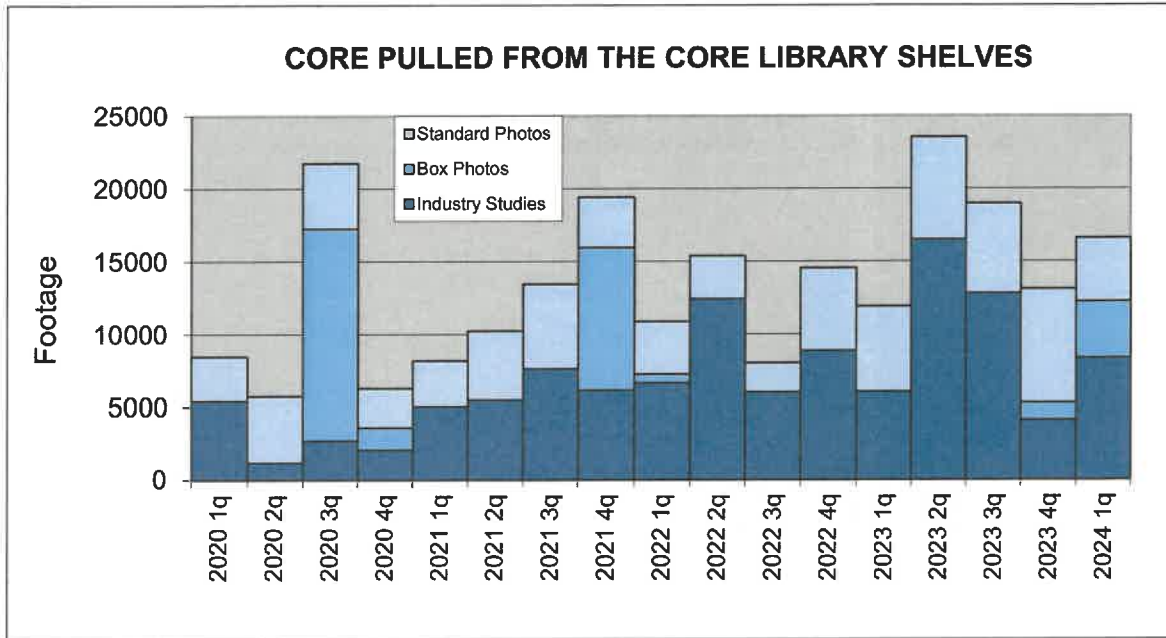
May 28, 2024

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Wilson M. Laird Core and Sample Library

During the first quarter of 2024, one oil company geologist, geologists from the Geological Survey, EERC, professors from NDSU and Moorhead State, and graduate students from UND and Colorado School of Mines studied 8,350 feet of core. A total of 4,359 feet of core was photographed generating 6,103 standard photographs and 3,932 feet of core was photographed with a tripod generating 311 photographs for the subscription site.



Workers pulled 16,583 feet of core from library shelves during the first quarter of 2024.



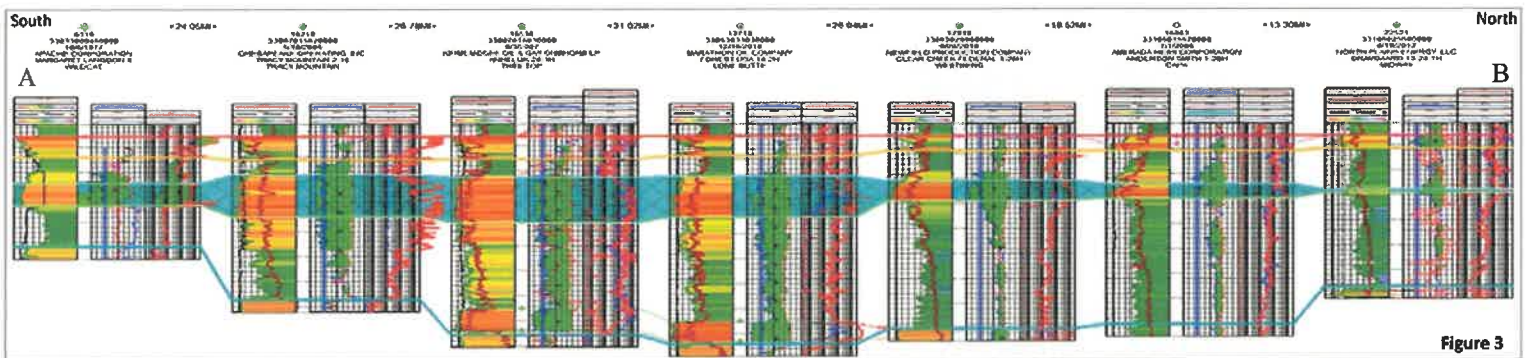
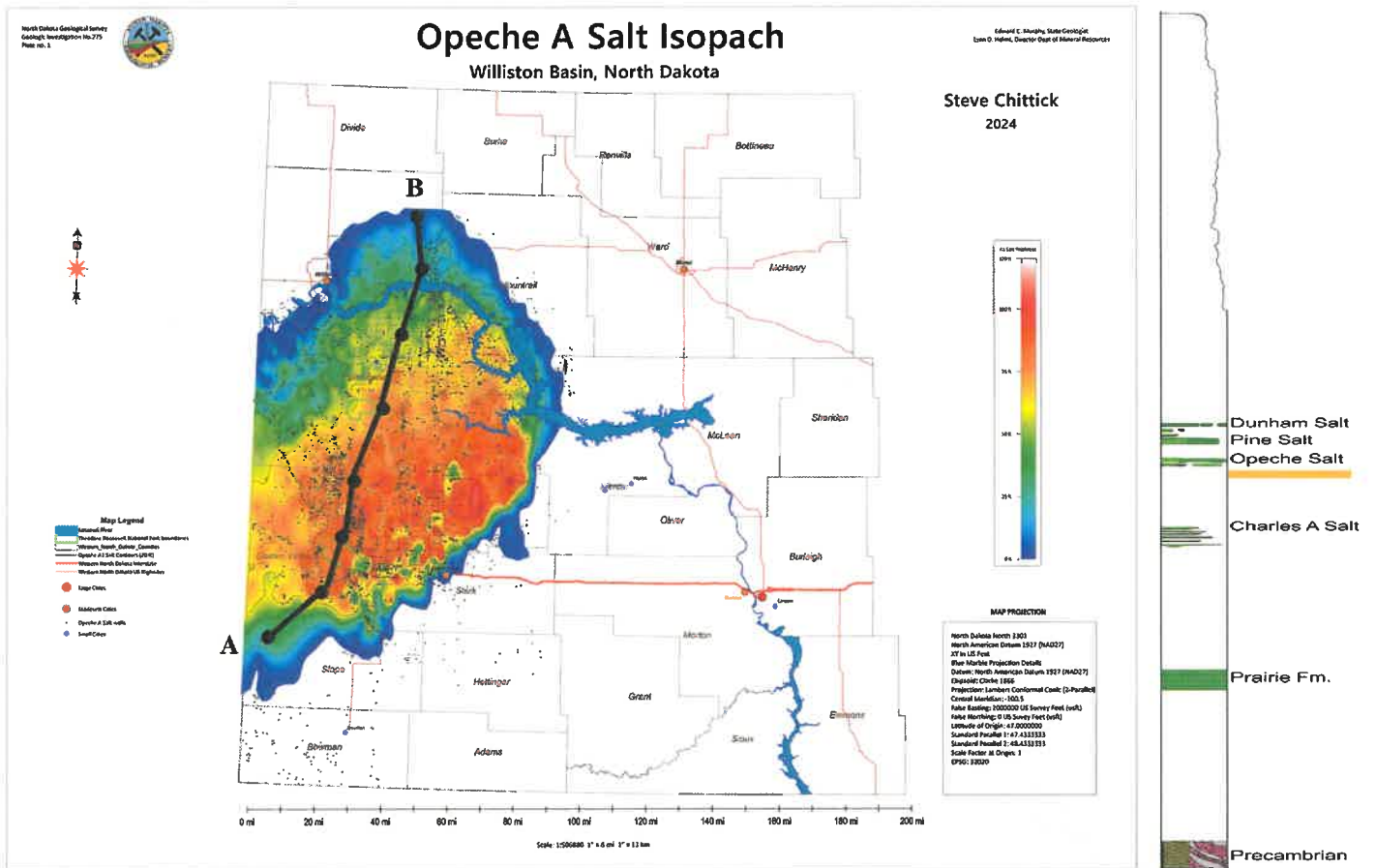
Core Photographs as Sampling Guides

Since we began posting core photographs 20 years ago, companies have been using them to identify cores that they wanted to study and sample in the core library. Additionally, companies that do not have the opportunity to travel to the core library have used those photographs to identify where they want samples taken for testing or for creating thin sections and our core library technicians pulls the core, identifies the part of the core to sample, obtains the rock sample, and then sends it to the company. In exchange, the company provides us with a copy of the test results.

Kent Hollands matching core to a core photograph sent in by a geology professor at MSU – Moorhead. Inset photo: As per this request, two billets were cut from this Broom Creek Formation core.

Opeche A and B Salt Maps

We recently published isopach and structure maps of the Opeche A and B Salts (Geologic Investigations nos. 275 and 278). These are the fifth and sixth salts that we have mapped in our salt project, ranging from the shallowest salts (the Dunham, Pine, Opeche A & B, and Charles A) to the deepest and thickest salt in the Williston Basin (Prairie Formation). The shallowest salts hold the most potential for cavern development and hydrocarbon storage while the Prairie Formation is of interest due to its potash content.



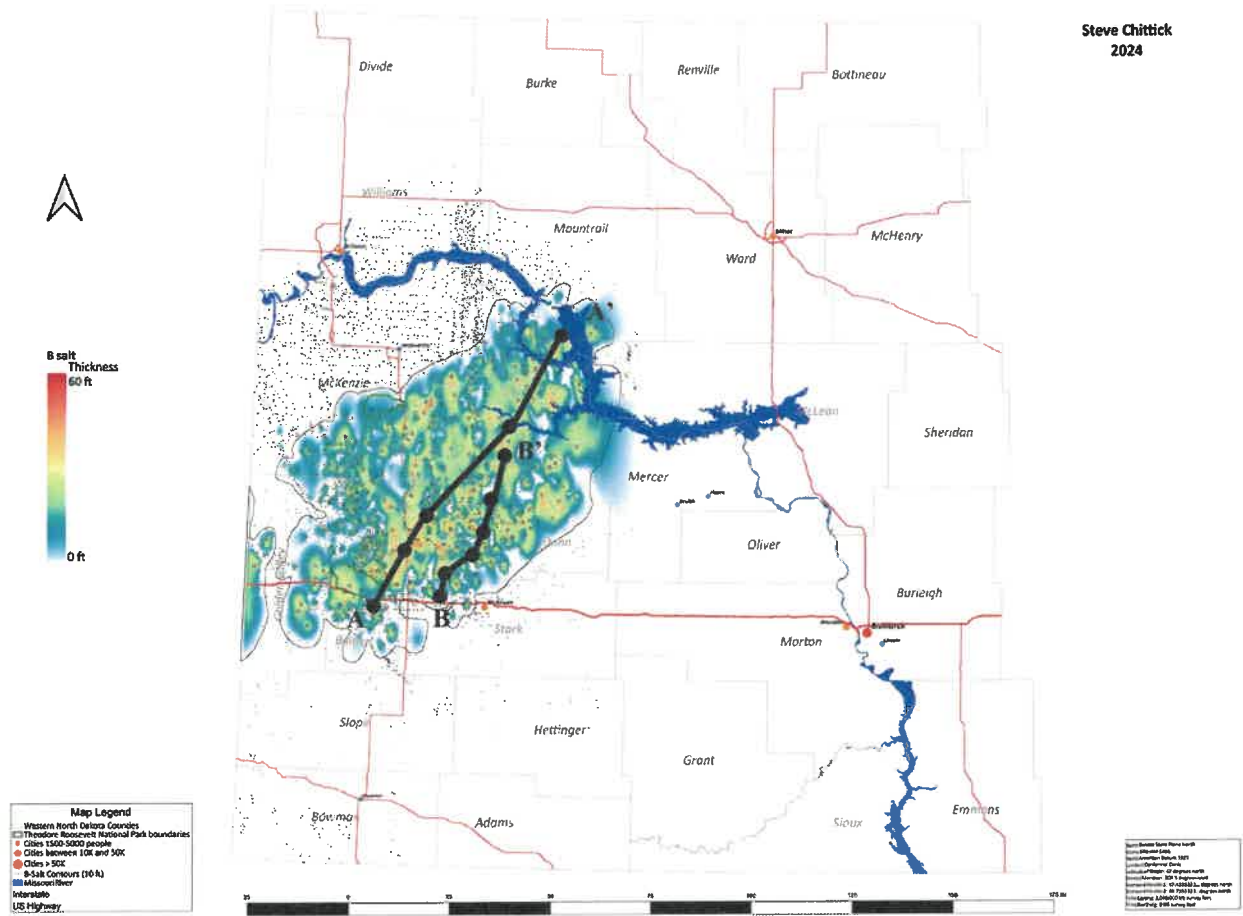
Top: An isopach of the Opeche A showing a maximum thickness of around 100 feet (dark red).
Bottom: A north to south cross-section across the Opeche demonstrating the A salt is thickest in the southern half of the deposit.



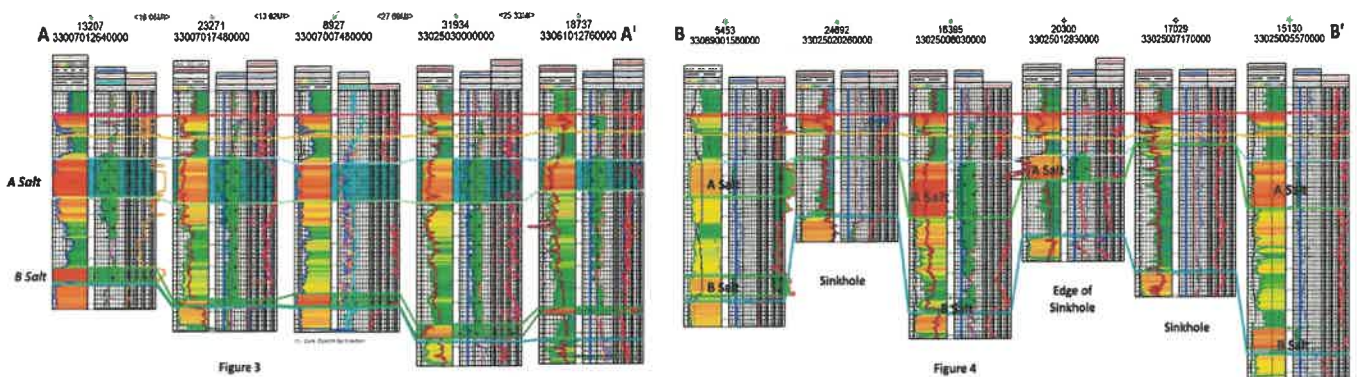
Opeche B Salt Thickness and Extent

Williston Basin, North Dakota

Steve Chittick
2024



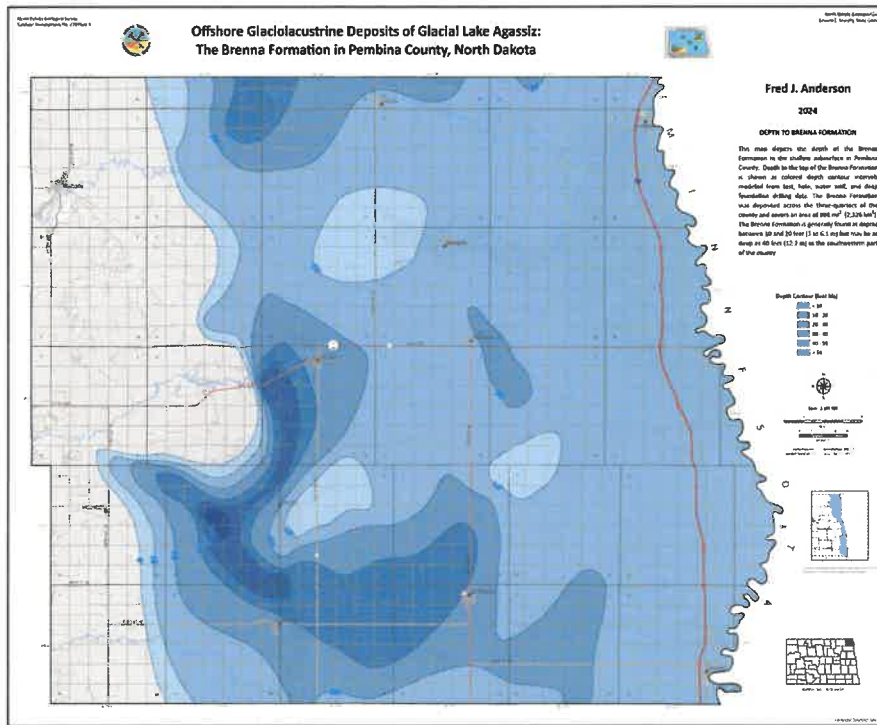
An isopach or thickness map of the Opeche B salt.



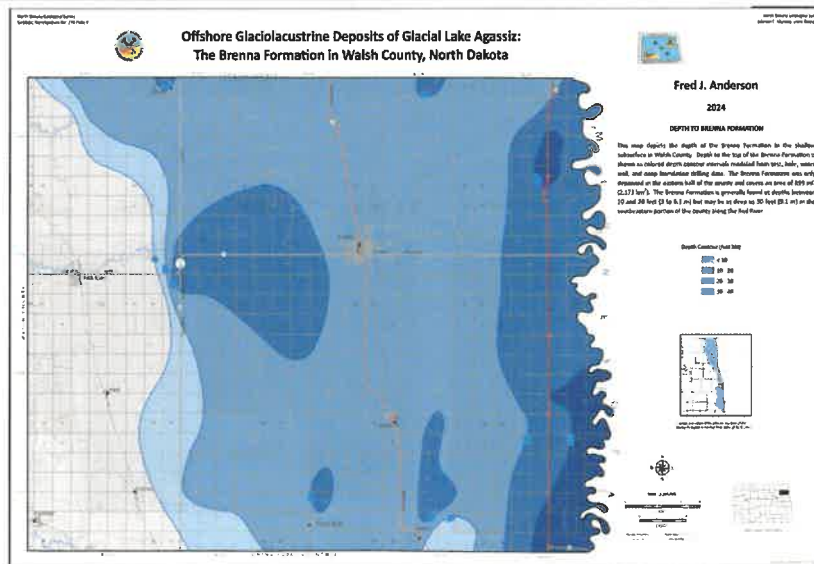
Southeast to northwest cross-sections through the Opeche Formation in Billings, Stark, Dunn, and Mountrail counties.

Brenna Formation Maps

The Geological Survey has recently published a series of drill hole location, depth, and thickness maps on the Brenna Formation, the lower of the two glacial lake clays, in the Red River Valley. The first two sets of maps cover Cass and Grand Forks counties and were published in 2023 and the two most recent sets of maps are for Walsh and Pembina counties (Geologic Investigations no. 276 and 278) were published this year. These maps are especially useful for construction projects including determining the approximate depths to use for piers and piles to obtain the correct foundation support.



The depth to the Brenna Formation in Pembina County.



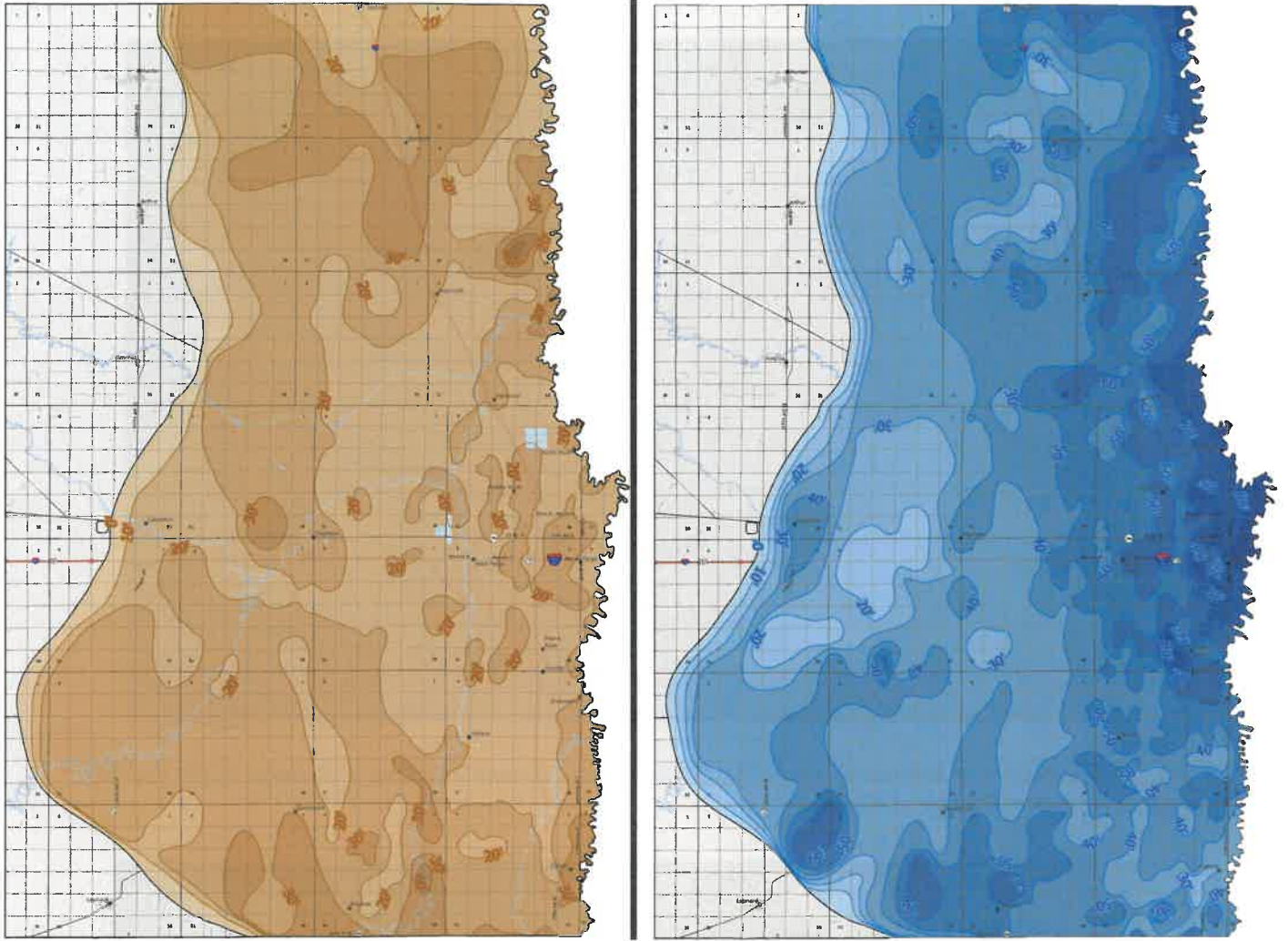
The depth to the Brenna Formation in the eastern half of Walsh County.



An exposure of laminated, silty clays of the Sherack Formation along a drainage of the Red River just to the north of the city of Fargo.



The gray-blue clays of the Brenna Formation are exposed during excavation for a waste cell in the Fargo landfill.



The depth (on the left) and the thickness (on the right) maps of the Brenna Formation in Cass County (Geologic Investigation no. 273). The contour interval for both maps is 10 feet.



Sediments of the Sherack Formation are exposed in the west bank of the Red River north of Fargo.

Water Problems in the Paleontology Offices

We are hopeful that Facilities has found a solution to the water problems in the Paleontology Section in the Heritage Center. The hole that was cut into the slab sat open for four months and remained dry once drain tile on the outside of the building was tied into the storm sewer. In the last six weeks, Facilities hired a contractor to install a sump and discharge pipe, repair the slab, recarpet the area, and add an electric outlet and alarm in the corner of the room.



This area in the paleontology wing of the Heritage Center had been divided into three small offices using Herman Miller partitions before the water problems last summer caused us to vacate the area. Facilities is confident that piping the drain tile out to the storm sewer and the installation of the sump pump will solve the water problem.

Regulatory Programs (January 1 to March 31, 2024)

Coal Exploration Program	No permits were issued this quarter.
Subsurface Mineral Program	No permits were issued this quarter.
UIC Class III Well Program	No permits were issued this quarter.
Geothermal Program	Three permits (0 residential, 3 commercial) were issued this quarter.
Paleontological Resource Program	Two permits were issued this quarter.

Publications This Quarter (January 1 to March 31, 2024)

- Anderson, F.J., 2024, Geophysical Maps of North Dakota: Bouger and Isostatic Gravity Anomaly and Aeromagnetic Anomaly, North Dakota Geological Survey Miscellaneous Map Series No. 45, 3 pl.
- Anderson, F.J., 2024, Offshore Glaciolacustrine Deposits of Glacial Lake Agassiz: The Brenna Formation in Pembina County, North Dakota, North Dakota Geological Survey Geologic Investigations No. 278, 3 pl.
- Anderson, F.J., 2024, Offshore Glaciolacustrine Deposits of Glacial Lake Agassiz: The Brenna Formation in Walsh County, North Dakota, North Dakota Geological Survey Geologic Investigations No. 276, 3 pl.
- Anderson, F.J., 2024, A Thump In The Night: Possible Cryoseismic Occurrences In North Dakota, DMR Geo News Newsletter, vol. 51, no. 1, p. 8-9.
- Anderson, F.J. 2024, Surface Geology of the Arthur SE Quadrangle, North Dakota: North Dakota Geological Survey 24K Map Series No. Artr SE - sg.
- Anderson, F.J. 2024, Surface Geology of the Gardner Quadrangle, North Dakota: North Dakota Geological Survey 24K Map Series No. Gdnr - sg.
- Anderson, F.J. 2024, Surface Geology of the Grandin Quadrangle, North Dakota: North Dakota Geological Survey 24K Map Series No. Grnd - sg.
- Anderson, F.J. and Murphy, E.C., 2024, Areas of Landslides Gorham SE Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Grhm SE - 13.
- Anderson, F.J. and Murphy, E.C., 2024, Areas of Landslides Gorham SW Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Grhm SW - 13.
- Anderson, F.J. and Murphy, E.C., 2024, Areas of Landslides Wannagan Creek East Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. WngC E - 13.
- Boyd, C.A., 2024, North Dakota's Mosasaur, DMR Geo News Newsletter, vol. 51, no. 1, p. 1-4.
- Chittick, S.D., 2024, Opeche B Salt Extent and Thickness, Williston Basin, North Dakota, North Dakota Geological Survey Geologic Investigations No. 277
- Chittick, S.D., 2024, Opeche A Salt Extent and Thickness, Williston Basin, North Dakota, North Dakota Geological Survey Geologic Investigations No. 275
- Kruger, N.W., 2024, Getting Into Hot Water, DMR Geo News Newsletter, vol. 51, no. 1, p. 6-7.
- Maike, C.A., 2024, Areas of Landslides Anamoose SW Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Anms SW - 13.
- Maike, C.A., 2024, Areas of Landslides Kongsberg NE Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Kgbg NE - 13.
- Maike, C.A., 2024, Areas of Landslides Balfour NW Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Blfr NW - 13.
- Maike, C.A., 2024, Areas of Landslides Balfour Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Blfr - 13.
- Maike, C.A., 2024, Areas of Landslides Drake NW Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Drke NW - 13.
- Maike, C.A., 2024, Areas of Landslides Drake Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Drke - 13.
- Maike, C.A., 2024, Areas of Landslides Anamoose Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Anms - 13.
- Maike, C.A., 2024, Areas of Landslides Clifton Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Clfn - 13.
- Maike, C.A., 2024, Areas of Landslides Kongsberg Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Kgbg - 13.
- Maike, C.A., 2024, Areas of Landslides Butte Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Butt - 13.

Maike, C.A., 2024, Areas of Landslides Kief Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Kief - 13.

Maike, C.A., 2024, Areas of Landslides Drake SW Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Drke SW - 13.

Maike, C.A., 2024, Areas of Landslides Drake SE Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Drke SE - 13.

Maike, C.A., 2024, Areas of Landslides Martin Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Mrtn - 13.

Maike, C.A., 2024, Areas of Landslides Alkali Lake Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. AlkL - 13.

Maike, C.A., 2024, Areas of Landslides Long Lake Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. LngL - 13.

Maike, C.A., 2024, Areas of Landslides Sheyenne Lake Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. ShyL - 13.

Maike, C.A., 2024, Areas of Landslides Turtle Lake Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. TrtL - 13.

Maike, C.A., 2024, Areas of Landslides Peterson Lake Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. PtrL - 13.

Maike, C.A., 2024, Areas of Landslides Pelican Lake Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. PcnL - 13.

Maike, C.A., 2024, Areas of Landslides Pelican Lake SE Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. PcnL SE - 13.

Maike, C.A., 2024, Areas of Landslides Lincoln Valley SE Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. LncV SE - 13.

Maike, C.A., 2024, Areas of Landslides Mertz Slough Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. MrzS - 13.

Maike, C.A., 2024, Areas of Landslides Pony Gulch Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. PnyG - 13.

Maike, C.A., 2024, Areas of Landslides Lincoln Valley SW Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. LncV SW - 13.

Maike, C.A., 2024, Areas of Landslides Horseshoe Valley Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. HshV - 13.

Maike, C.A., 2024, Areas of Landslides Lincoln Valley Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. LncV - 13.

Anderson, F.J., 2024, Areas of Landslides Blacktail Coulee Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. BlkC - 13.

Anderson, F.J., 2024, Areas of Landslides Ruso Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Ruso - 13.

Moxness, L.D., 2024, Areas of Landslides Milnor Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Mlnr - 13.

Moxness, L.D., 2024, Areas of Landslides De Lamere Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. DLmr - 13.

Moxness, L.D., 2024, Areas of Landslides Lisbon Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Lsbn - 13.

Moxness, L.D., 2024, Areas of Landslides Lisbon NE Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Lsbn NE - 13.

Moxness, L.D., 2024, Areas of Landslides Venlo Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Vnlo - 13.

Moxness, L.D., 2024, Areas of Landslides Wyndmere NW Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Wynd NW - 13.

Moxness, L.D., 2024, Areas of Landslides Wyndmere NE Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Wynd NE - 13.

Moxness, L.D., 2024, Areas of Landslides Wyndmere SE Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Wynd SE - 13.

Moxness, L.D., 2024, Areas of Landslides Elliot Quadrangle, ND Quadrangle: North Dakota Geological Survey 24K Map Series No. Elot - 13.

Starns, E.C., and Nesheim, T.O., 2024, Redevelopment of Madison Fields in Burke County Demonstrates Fracture Stimulation Is Effective, DMR Geo News Newsletter, vol. 51, no. 1, p. 14-16.
 York, B.C., 2024, North Dakota Geological Survey Geologic Map Viewer: Touring The State's New Online Resource, DMR Geo News Newsletter, vol. 51, no. 1, p. 10-13.

Presentations This Quarter (January 1 to March 31, 2024)

- J. Person, Tour of Dakota, general public, Heritage Center, January 10.
- B. Barnes, J. Person, Prehistoric Fishing, Missouri Valley Montessori, Heritage Center, January 11.
- J. Person, Minnesota Public Radio, Beulah Mammoth interview, Heritage Center, January 11.
- M. Householder, Dakota tour, General Public, Heritage Center, February 2.
- J. Person, Dakota tour, General Public, Heritage Center, February 7.
- J. Person, Paleo lab and collections tour, Heritage Center, March 6.
- T. Ford, Paleo lab and collections tour, St. Joe's Montessori preschool (Mandan), Heritage Center, March 11.
- B. Barnes, Paleo lab and collections tour, "Mom's Group," Heritage Center, March 12.
- B. Barnes, Paleo lab and Dakota tour, Heritage Center staff and visitors, Heritage Center, March 15.
- B. Barnes, Rock Collection tour, Central Dakota Gem Mineral Society, Heritage Center, March 17.
- B. Barnes, J. Person, Paleo lab and collections tour, St. Anne's 3rd grade, Heritage Center, March 20.
- J. Person, B. Barnes, Prehistoric Fishing, Sunrise 2nd grade, Heritage Center, March 21.
- C. Boyd, NDGS Public Fossil Digs, Potential Donors, Online, March 27.
- B. Barnes, J. Person, Science Olympiad Fossils, Science Olympiad Jr & Sr High Bismarck State College, March 28.
- C. Lash, Paleontology as a Career, Horizon Middle School 8th Graders, March 28.
- L. Moxness, E. Murphy, Geoscience Occupations, Horizon Middle School 8th Graders, March 28.



Amidon sees ups, downs for methane

By LAUREN DONOVAN
 Bismarck, N.D.

AMIDON - At Amidon it's always about water.

In one of the driest years in decades, the issue of water from experimental coal-bed methane production was definitely on people's minds Tuesday at a hearing in the two-story wooden courthouse in town.

The State Oil and Gas Division wants to sink a section of test wells near Amidon and see if the deep, thick coal vein underneath produces the gas. If it does, it could pave the way for the state's newest energy development, which in other western states has been enormous, both in financial and environmental terms. Huge quantities of water have to be drawn off the coal seam before the methane, a natural gas, is released.

The 70 or so ranchers and residents who packed into the stuffy Slope County hearing room had real concerns about what the extraction of all that water will do to the water in their homes and stock tanks. One section of wells would pump about 200,000 gallons of water every day.

The answer, in simple terms, is it's too soon to know.

They were, politely inquisitive and their concerns didn't go so far as to add up to an objection.

The Oil and Gas Division, along with several other state agencies, plans to ask the Department of Energy for a \$3 million grant to drill the wells in order to learn if North Dakota's coal can even produce methane. It'll be months before the grant decision is made and several more before the state has its permits in order and drilling starts in September. There'll be several junctures for more public comment along the way.

One rancher, Kenny Hanson of rural Amidon, says bring it on. "I guess I fought it (ranching) long enough," he said.

Hanson said he'd like the chance to realize some revenue from his land, revenue that doesn't live or die by whether the rain falls, which it didn't this year, or the grass grows, which it also didn't.

But it's that kind of vulnerability, because of water and rainfall, that has Slope County Commissioner Paul Brooks aiming for

Docket for Hearing

Wednesday, April 24, 2024

N.D. Oil & Gas Division N.D. Oil & Gas Division 1000 East Calgary Avenue

Case No. 30669, Order No. 33319: Application of Hess Bakken Investments II, LLC for an order amending the applicable orders for the Blue Buttes-Bakken Pool to establish an overlapping laydown 1280-acre spacing unit described as Section 12, T.150N., R.96W. and Section 7, T.150N., R.95W., McKenzie County, ND, and authorize one horizontal well to be drilled on such unit, or granting such other relief as may be appropriate.

Docket for Hearing

Wednesday, April 24, 2024

N.D. Oil & Gas Division N.D. Oil & Gas Division 1000 East Calgary Avenue

Case No. 30804, Order No. 33464: Application of Hess Bakken Investments II, LLC for an order amending the applicable orders for the Blue Buttes-Bakken Pool to establish an overlapping 3840-acre spacing unit described as Sections 25 and 36, T.151N., R.96W., Sections 30 and 31, T.151N., R.95W., Section 1, T.150N., R.96W., and Section 6, T.150N., R.95W., McKenzie County, ND, and authorize one horizontal well to be drilled on such unit, or granting such other relief as may be appropriate.

Docket for Hearing

Wednesday, April 24, 2024

N.D. Oil & Gas Division N.D. Oil & Gas Division 1000 East Calgary Avenue

Case No. 30809, Order No. 33469: In the matter of a hearing called on a motion of the Commission to consider the confiscation of all production-related equipment and salable oil at the Erickson 1-27h well (File No. 16087), Lot 1 Section 27, T.164N., R.97W., Crosby Field, Divide County, ND, Operated by Vast Operations, LLC, or any working interest owner, pursuant to NDCC §§ 38-08-04 and 38-08-04.9.

Docket for Hearing

Wednesday, April 24, 2024

N.D. Oil & Gas Division N.D. Oil & Gas Division 1000 East Calgary Avenue

Case No. 30810, Order No. 33470: In the matter of a hearing called on a motion of the Commission to consider the confiscation of all production-related equipment and salable oil at the Landstrom 1-33h well (File No. 16307), NENE Section 33, T.164N., R.97W., Crosby Field, Divide County, ND, operated by Vast Operations, LLC, or any working interest owner, pursuant to NDCC §§ 38-08-04 and 38-08-04.9.

Docket for Hearing

Wednesday, April 24, 2024

N.D. Oil & Gas Division N.D. Oil & Gas Division 1000 East Calgary Avenue

Case No. 30811, Order No. 33471: In the matter of a hearing called on a motion of the Commission to consider the confiscation of all production-related equipment and salable oil at the Burner 1-34h well (File No. 16267), NENE Section 34, T.164N., R.97W., Crosby Field, Divide County, ND, operated by Vast Operations, LLC, or any working interest owner, pursuant to NDCC §§ 38-08-04 and 38-08-04.9.

Docket for Hearing
Wednesday, April 24, 2024
N.D. Oil & Gas Division N.D. Oil & Gas Division 1000 East Calgary Avenue

Case No. 30812, Order No. 33472: In the matter of a hearing called on a motion of the Commission to consider the confiscation of all production-related equipment and salable oil at the 29-144-102 Burlington Northern 1 well (File No. 8234), NWNW Section 29, T.144N., R.102W., Morgan Draw Field, Billings County, ND, operated by Dry Creek Disposal Company, Inc., or any working interest owner, pursuant to NDCC §§ 38-08-04 and 38-08-04.9.

North Dakota Industrial Commission



Doug Burgum
Governor

Drew H. Wrigley
Attorney General

Doug Goehring
Agriculture Commissioner

Resolution of Appreciation

- Whereas,** Lynn Helms has admirably served the State of North Dakota since June 1998, both as the Director of the Oil and Gas Division and as the Director of the Department of Mineral Resources; and
- Whereas,** Lynn has been dedicated to the Department's mission of encouraging and promoting the development, production, and utilization of oil and gas in the state in such a manner as will prevent waste, maximize economic recovery, and fully protect the correlative rights of all owners to the end that the landowners, the royalty owners, the producers, and the general public realize the greatest possible good from these vital natural resources; and
- Whereas,** During Lynn's tenure with the Department, North Dakota's average monthly oil production has grown from approximately 99,000 barrels per day in 1998 to over 1.2 million barrels per day in 2024; and
- Whereas,** Lynn's work during this time fostered a stable regulatory environment within which the incredible growth of North Dakota's oil and gas industry was made possible, which has resulted in the greatest possible good for all North Dakotans, revenues from which are used to fund public infrastructure like drinking water, schools, and roads; and
- Whereas,** Lynn played a key role in advancing many milestones on behalf of North Dakota, including primacy over the Environmental Protection Agency's Class VI carbon dioxide injection program, historic tribal-state oil tax sharing agreements, demonstrating the safety of shipping Bakken crude oil by rail, providing the framework for the federal REGROW Act, and serving as a well-respected national leader in organizations like the Interstate Oil and Gas Compact Commission; and
- Whereas,** Lynn's dedication to the Industrial Commission and to the State of North Dakota will leave a lasting legacy for all citizens of our state and is deserving of recognition.

Now, therefore, the North Dakota Industrial Commission hereby expresses deep gratitude to Lynn Helms for his service to the citizens of North Dakota and wishes him the very best in his retirement.

Adopted this 28th day of May, 2024.

INDUSTRIAL COMMISSION OF NORTH DAKOTA

Doug Burgum
Governor

Drew H. Wrigley
Attorney General

Doug Goehring
Agriculture Commissioner

North Dakota Industrial Commission



Doug Burgum
Governor

Drew H. Wrigley
Attorney General

Doug Goehring
Agriculture Commissioner

Resolution of Delegation: Geological Survey

Whereas, The Industrial Commission ("Commission") has a range of responsibilities and broad authority under Title 38 of the North Dakota Century Code, titled "Mining and Gas and Oil Production" and Chapters 54-17.3 titled "Paleontological Resource Protection," 54-17.4 titled "Geological Survey" and 23-20.2 titled "Disposal of Nuclear & Other Waste Material."; and

Whereas, the Commission has authority under North Dakota Century Code Chapters 38-08, "Control of Gas and Oil Resources;" 38-08.1, "Geophysical Exploration Requirements;" 38-12, "Regulation, Development, and Production of Subsurface Minerals;" 38-12.1, "Exploration Data;" 38-15, "Resolution of Conflicts in Subsurface Mineral Production;" 38-19, "Geothermal Resource Development Regulation;" 38-21, "Exploration Fund;" 38-22, "Carbon Dioxide Underground Storage;" and 38-25, "Underground Storage of Oil and Gas"; and

Whereas, The Commission has adopted administrative rules to implement Title 38, and Chapters 54-17.3, and 54-17.4, which provides for the Director of the Department of Mineral Resources to either "appoint the state geologist or carry out the duties of the state geologist along with the duties of director of mineral resources."; and

Whereas, North Dakota Century Code Section 38-08-04.2 provides that the Commission "may delegate to the director of oil and gas all powers the commission has under this title and under rules enacted under this title."; and

Whereas, Lynn Helms, Director of the Department of Mineral Resources has announced his intention to retire, effective June 30th, 2024.

Now, therefore, the North Dakota Industrial Commission delegates to the State Geologist the authority to carry out, on the Commission's behalf and in its name, all of the Commission's Chapters 54-17.3, 54-17.4 and 23-20.2 statutory and administrative rule authority and responsibility. This delegation of authority does not, however, include the following:

1. Executing final orders for cases in which the person opposing the requested relief presents substantial or procedurally sound reasons for the opposition;
2. Executing final orders for cases in which the State Geologist contemplates granting relief that substantially differs from that requested;
3. Initiating and settling litigation in the courts;
4. Executing final orders imposing a fine for administrative cases in which the person who is the subject of an administrative complaint opposes the proposed penalty and the State Geologist cannot reach a negotiated settlement with such person;

5. Executing orders granting or denying a petition for reconsideration;
6. Executing final orders for cases dealing with the development or production of subsurface minerals.

Adopted this 28th day of May, 2024.

INDUSTRIAL COMMISSION OF NORTH DAKOTA

Doug Burgum
Governor

Drew H. Wrigley
Attorney General

Doug Goehring
Agriculture Commissioner

North Dakota Industrial Commission



Doug Burgum
Governor

Drew H. Wrigley
Attorney General

Doug Goehring
Agriculture Commissioner

Resolution of Delegation: Oil and Gas Division

- Whereas,** The Industrial Commission ("Commission") has a range of responsibilities and broad authority under Title 38 of the North Dakota Century Code, titled "Mining and Gas and Oil Production" and Chapters 54-17.3 titled "Paleontological Resource Protection," 54-17.4 titled "Geological Survey" and 23-20.2 titled "Disposal of Nuclear & Other Waste Material."; and
- Whereas,** the Commission has authority under North Dakota Century Code Chapters 38-08, "Control of Gas and Oil Resources;" 38-08.1, "Geophysical Exploration Requirements;" 38-12, "Regulation, Development, and Production of Subsurface Minerals;" 38-12.1, "Exploration Data;" 38-15, "Resolution of Conflicts in Subsurface Mineral Production;" 38-19, "Geothermal Resource Development Regulation;" 38-21, "Exploration Fund;" 38-22, "Carbon Dioxide Underground Storage;" and 38-25, "Underground Storage of Oil and Gas"; and
- Whereas,** The Commission has adopted administrative rules to implement Title 38, and Chapters 54-17.3, and 54-17.4, which provides that "the industrial commission is authorized to appoint a director of mineral resources who shall serve at the pleasure of the commission. The director of mineral resources shall carry out the duties of the director of oil and gas along with the duties of director of mineral resources."; and
- Whereas,** North Dakota Century Code Section 38-08-04.2 provides that the Commission "may delegate to the director of oil and gas all powers the commission has under this title and under rules enacted under this title."; and
- Whereas,** Lynn Helms, Director of the Department of Mineral Resources has announced his intention to retire, effective June 30th, 2024.

Now, therefore, the North Dakota Industrial Commission delegates to the Director of Oil and Gas the authority to carry out, on the Commission's behalf and in its name, all of the Commission's Title 38 statutory and administrative rule authority and responsibility. This delegation of authority does not, however, include the following:

1. Executing final orders for cases dealing with creating and terminating secondary and tertiary recovery units;
2. Executing final orders for cases in which the person opposing the requested relief presents substantial or procedurally sound reasons for the opposition;
3. Executing final orders for cases in which the Director contemplates granting relief that substantially differs from that requested;
4. Initiating and settling litigation in the courts;

5. Executing final orders imposing a fine for administrative cases in which the person who is the subject of an administrative complaint opposes the proposed penalty and the Director cannot reach a negotiated settlement with such person;
6. Executing orders granting or denying a petition for reconsideration;
7. Executing final orders for cases dealing with carbon dioxide storage facility permits and certificates of carbon dioxide project completion;

Adopted this 28th day of May, 2024.

INDUSTRIAL COMMISSION OF NORTH DAKOTA

Doug Burgum
Governor

Drew H. Wrigley
Attorney General

Doug Goehring
Agriculture Commissioner